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DECEMBER 1982/$2.00

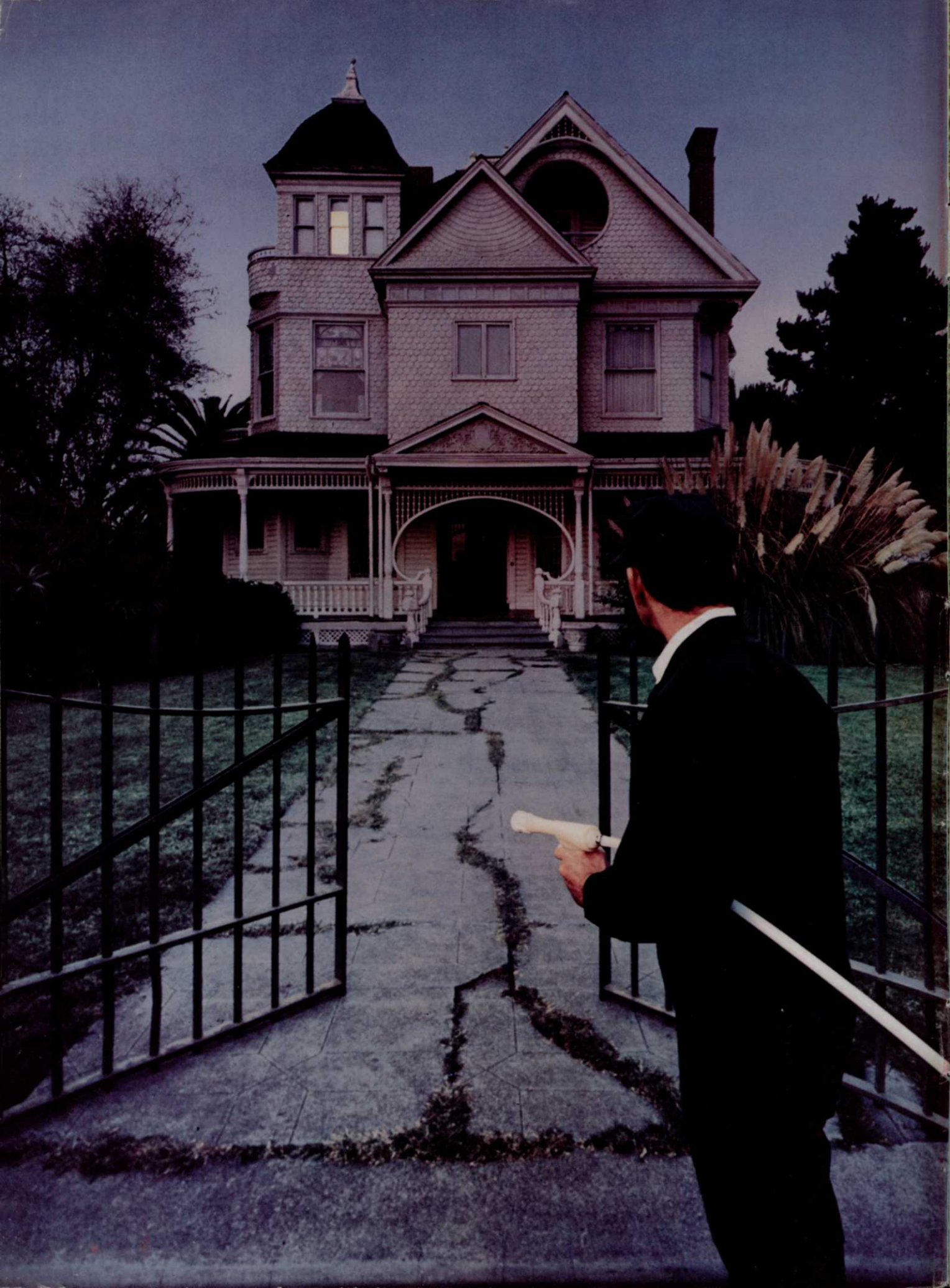
WEEDS TREES & TURF

The Journal of Landscape and Golf Course Design, Construction and Care Since 1962

Soilless Mixes, Better Design Stops Compaction on Greens

Landscape Management Profile: Apartments and Condominiums

1982 Index of Articles and Authors



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WT&T

Cover: Wide turf tires lessen equipment-caused compaction on the golf course. See Part 3 of Ron Fream's Compaction on the Golf Course, page 22.

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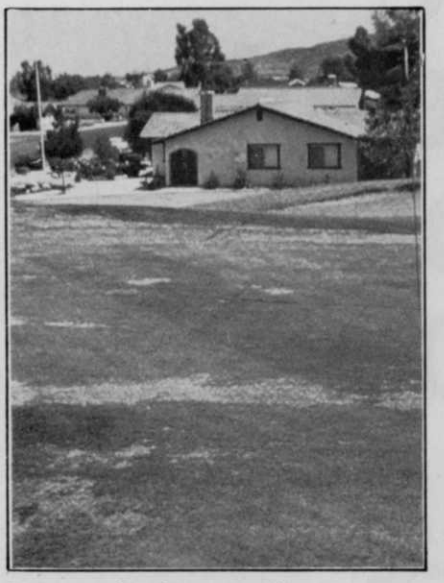

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For the name of the nearest dealer, or a free folder on the John Deere diesel utility tractors, call 800-447-9126 toll free (800-322-6796 in Illinois) or write John Deere, Dept. 69, Moline, Illinois 61265.

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Go with the best in '83. Dacthal W-75.

Dacamine® 360D herbicide. Kills perennials better than ordinary 2,4-D. Dacamine 360D virtually eliminates the possibility of weed regrowth. Works particularly well on plaintain and 70 other tough perennials. Gets white clover* too.

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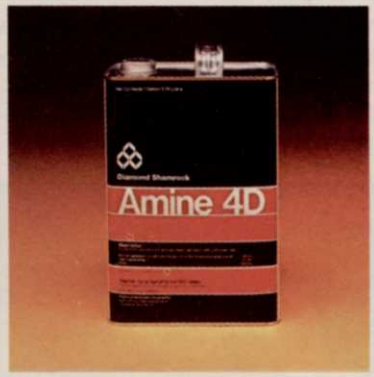
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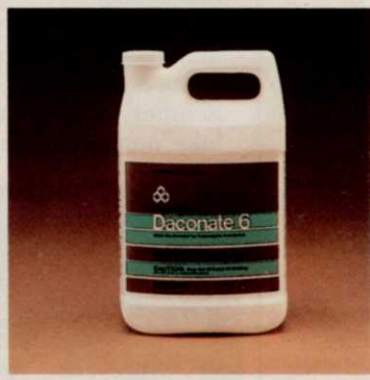

Daconate 6

WT&T

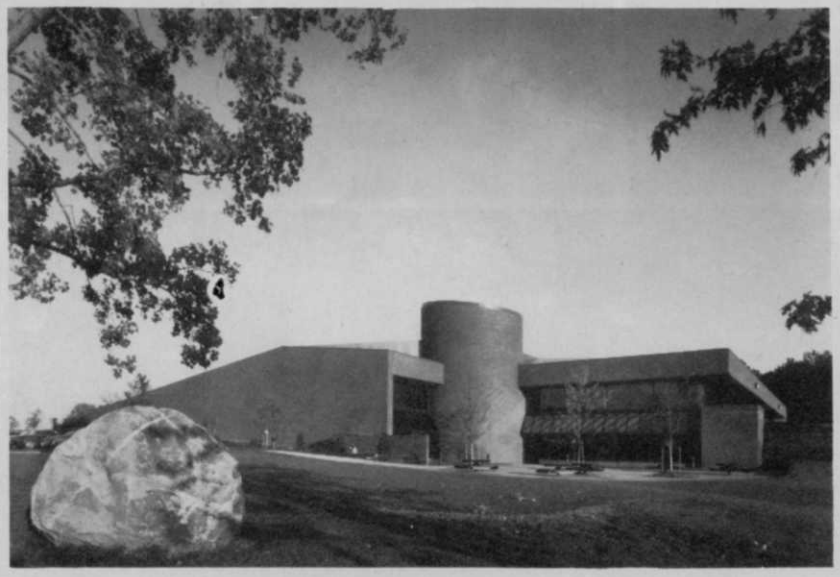
OUTLOOK

By Bruce F. Shank, Executive Editor

The new domain of WT&T

Perhaps the most valuable experience for me professionally was my limited involvement in the construction and landscaping of our new office in Middleburg Heights, Ohio. I was an observer, watching the architect and the landscape architect work with the landscape contractor. If I had a responsibility it was to save money while preserving the landscape plan of William H. Benke and Associates.

For two years I visited the building site with our construction manager Ken Erman, the architect's representative Rich Kraly of Tufts & Wensel, Lee Benke, and the landscape contractor John Kramer. I'd wake up at night bothered by steep slopes, a leaking lake, and getting the lawn in before winter.



When the job was finished I got my papers for New York. For two years I wondered how the landscape looked as it grew.

Now, I see that award-winning landscape every day. It's gratifying to be attached to a sculptured piece of earth surrounding a modern building. It's also helpful to me to relate your business experiences against what happened here.

I get paid to put out a magazine, but I also derive satisfaction just by gazing at this reconstructed mass of clay. It must be something you have over others, that extra sense of accomplishment by having the results to visit and to watch your work grow. **WTT**

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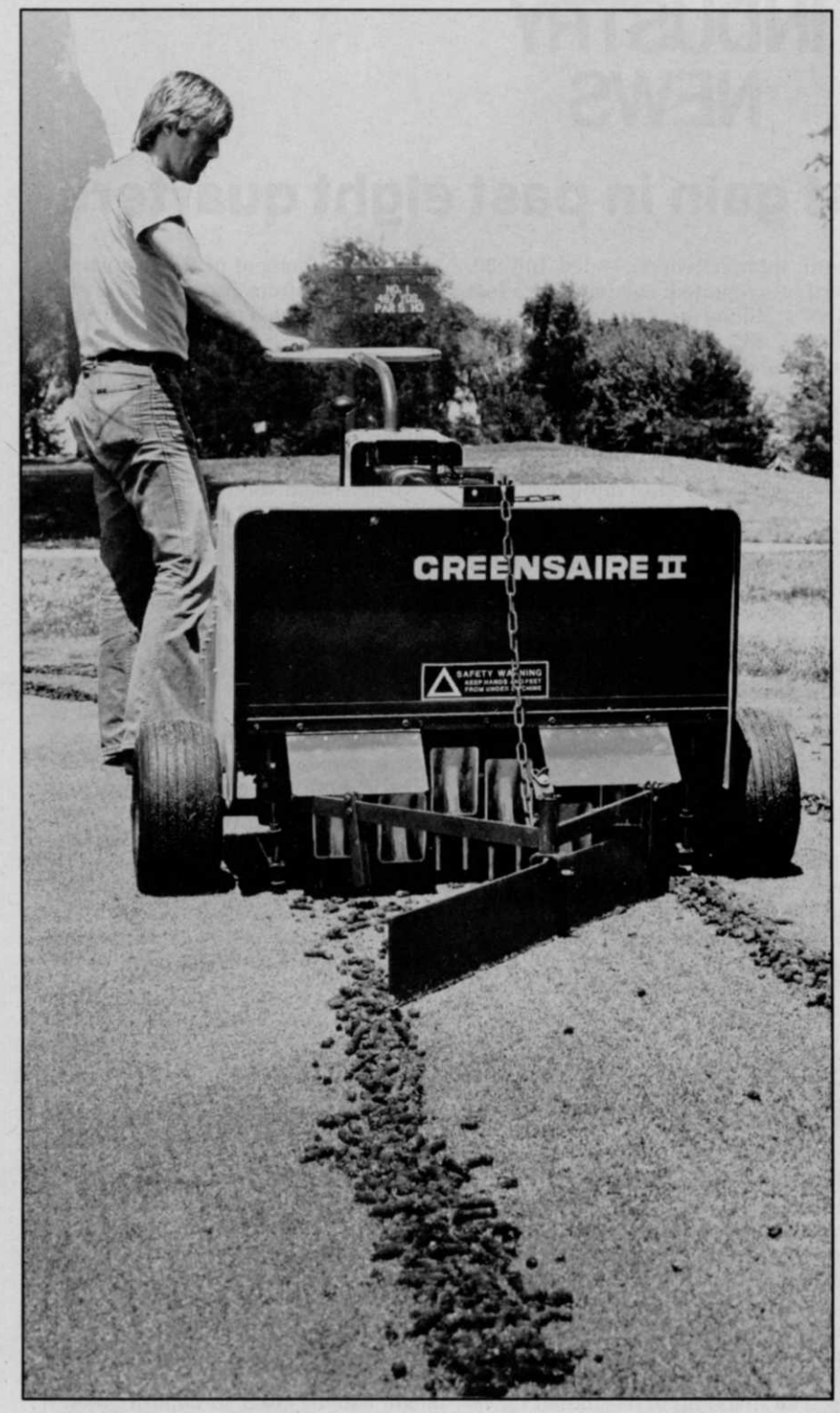

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Better results, that's why.

They know the Ryan Greensaire's deeper penetration removes more soil, without tearing up turf.

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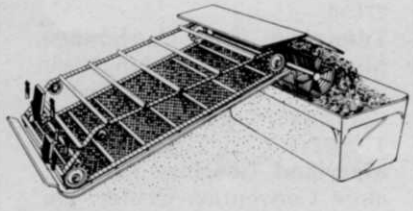
They also like the fact that Greensaire's tines remove 36 cores, up to three inches long, from every square foot of turf.

Attach the Ryan Core Processor to Greensaire to aerate, collect thatch and break up the soil for top dressing in one quick operation.



The Ryan Greensaire II. When you see what it does for your greens, you'll know why it's worth the walk.

For more information about Greensaire II and Core Processor, call 800-228-4444. CUR 3-8785

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GREEN INDUSTRY NEWS

COMPANY ENCOURAGED

Toro reports first gain in past eight quarters

For the first time in the past eight quarters, the Toro Company has registered an increase in sales from the comparable quarter in 1981.

A net loss of $100,000 or $.09 per share on sales of $50.7 million for the fourth quarter (which ended July 30, 1982) was reported, compared to a loss of $4.9 million or $.95 per share on sales of $42.1 million for the fourth quarter of the previous year.

For the fiscal year, Toro lost $8.7 million or $1.86 per share on sales of $203.8 million. The loss was an improvement of $4.4 million from the fiscal 1981 loss of $13.1 million or $2.66 per share. Sales that year were $247 million.

Stephen F. Keating, Chairman of Toro's Executive Committee, said, "The year was characterized by restructuring and cost containment as the company moved aggressively to reduce the size of our debt and field inventories of products."

Keating said it was too early to predict a complete turnaround, but said the company was encouraged by the fourth quarter results.

He also declined to make projections for fiscal 1983, but did say the first quarter will show a loss, but that the loss will be "far smaller" than the $6.5 million or $1.24 per share lost in the first quarter of fiscal 1982.

Toro President Kendrick B. Melrose said that 85 percent of the company's drop in sales from fiscal 1981 to 1982 could be attributed to the snowthrower product line.

"Our total snowthrower sales at the company level were just $5.9 million," Melrose said. "That's down from $38.2 million the year before and a peak of $129.9 million in 1980."

Melrose said the two key improvements in fiscal 1982 were in the areas of debt and operating expense.

"We continued to reduce operating expenses during the year by $19.5 million over the year before," he said, "and our average total debt was reduced by some $18.6 million over the course of the year."

Melrose said sales for fiscal 1982 in the company's irrigation product area rose approximately 15 percent while sales in both consumer products and professional turf equipment were down due to already overstocked inventories.

Toro's international business was down 23 percent in sales, principally due to the weakness of the European economy and relative strength of the U.S. dollar.

COMING SOON

January State Turf Shows

North Carolina Turf Conference, Pinehurst Hotel, Jan. 4-6. Contact L. T. Lucas, 3409 Gardner Hall, NCSU, Raleigh, NC 27650.

Tennessee Turf Conference, Music City Rodeway Inn, Nashville, Jan. 6-7. Contact Brenda Goins, 2837 Logan St., Nashville, TN 37211.

Maryland Turfgrass '83, Baltimore Convention Center, Jan. 10-12. Contact Thomas Turner, 112 H.J. Patterson Hall, University of Maryland, College Park, MD 20742.

Nebraska Turf Conference, Holiday Inn, Omaha, Jan. 11-13. Contact Robert Shearman, University of Nebraska, Dept. of Horticulture, 377 Plant Science Bldg., Lincoln, NB 68583.

New Hampshire Turf Conference, Sheraton Wayfarer, Bedford, Jan. 13-14. Contact John Roberts, Extension Specialist, University of New Hampshire, Durham, NH.

Rocky Mountain Turf Conference, Colorado State University, Jan. 13-14. Contact Jack Butler, Dept. of Horticulture, CSU, Ft. Collins, CO.

Michigan Turf Conference, Lansing, Jan. 18-19. Contact Paul Reike, MSU, Crop and Soil Science, East Lansing, MI 48824.

Virginia Turf Conference, Norfolk, Jan. 18-20. Contact John Hall, Agronomy Dept., Virginia Polytechnic Institute, Blacksburg, VA 24061.

Bioengineers clone gene for herbicide resistance to Roundup

Horticulture may be on the verge of a technological breakthrough if Calgene Inc., Davis, CA, can successfully incorporate a herbicide-resistant gene into desired crops.

Calgene's Dr. Luca Comai and his team have cloned (reproduced) a gene (genetic unit) which works in plant bacteria to resist the effects of Roundup. The first crop to be studied for incorporation is cotton. "Cotton has many weed problems," said Calgene Vice President Al Adamson, "and cotton farmers could benefit from herbicide resistant varieties."

"Genetic engineering for herbicide resistance will have tremendous impact on productivity and production costs of agriculture," claims Calgene President Norman Goldfarb. He expects the research work of transferring the gene from the bacterium in which it is genetically constructed to a crop plant by sometime in 1983.

By developing herbicide resistance in desired plants, a broader range herbicide can be used to control weeds around the plant. Roundup is a broad spectrum herbicide from Monsanto used in both agriculture and horticulture. Monsanto has no involvement in Calgene or the research program. Calgene is discussing herbicide resistance programs with several companies.

NORTHRUP KING PRESENTS

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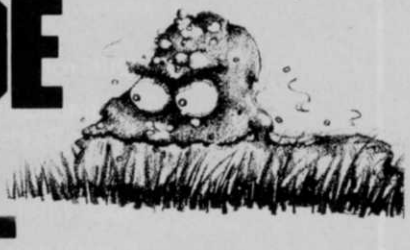

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Athletic Pro Mix	High maintenance athletic turf	Both are well suited for new seeding or overseeding. Fast establishing, excellent traffic tolerance, and rapid recovery. Provides good footing.
Athletic Pro II Mix	Low to moderate maintenance athletic turf.	
Boulevard Mix	Any area with high pH (roadsides, sidewalks, boulevards, beachfronts, etc.)	Contains both "Fults" *Puccinellia distans* and Dawson red fescue which thrive on high saline or alkaline soils. Performs at low to high fertility levels.
Landscape Pro Mix	School grounds, cemeteries, golf course roughs, lawns	Fast establishing. Adapts to broad range of conditions and management levels. Low to moderate fertility requirements.
Overseeder II Mix	Fairways, tees, athletic fields	Fast establishing, traffic tolerant, disease resistant, penetrates compacted soil.
Overseeder III Mix (Formerly Medalist North Mix)	Fairways, tees, cart paths, wear areas	Long term quality in high traffic areas. Clean mowing and disease tolerant.
Premium Sod Blend	Commercial sod producers	Fast establishing, exceptional dark green color, shade tolerant, superior disease resistance.
Special Park Mix	Parks, commercial developments, lawns	Low fertility tolerance, shade tolerant, adapts to wide range of soil types.

Ask your Northrup King distributor about the Medalist Turf Products for your needs. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.

MEDALIST TURF PRODUCTS

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Jacobsen. Out front again with new out front mowers.

The new HF-5.

Highly maneuverable, the lightweight, compact HF-5 gives you 3, 4 and 5 gang versatility, plus the power and maintenance ease of a complete hydraulic system. Engineered to cut up to 50 acres in eight hours and help trim your budget down to size.

Out Front Mowing – Cuts ahead of the wheels to eliminate tracking.

Hydraulically Driven Reels – Cuts wet or dry grass easily. Reels can be reversed from the operator's seat. Instant backlapping.

Hydrostatic Variable Speed Transmission – Variable ground speed to match terrain and turf conditions. Eliminates turf damage.

Diesel Engine – Power, economy and longer engine life.

Hydraulic Lift Mowers – 84" to 106" to 133" cutting width all at the operator's fingertips.

The new Turf King II.

Known for its maneuverability and quality of cut, in wet grass or dry, the out front mowing Turf King II is available in both 76" and 84" cutting widths. A versatile machine designed for comfort and the economy you need from a high quality triplex mower.

Hydrostatic Drive – Reel speed independent of ground speed. Variable forward and reverse controlled by single pedal. No clutching.

Out Front Mowing – Cuts ahead of the wheels to eliminate tracking.

Limited Slip Differential – Better traction on slopes and soft ground.

The new Turfcat II.

A year-round out front rotary system. Available in three engine sizes in either air-cooled gasoline or water-cooled diesel with a choice of three deck sizes and implements ranging from a flail mower to a snow blower. The rugged Turfcat II does more than maneuver, climb and trim. It lasts.

Ducted, Screened, Air-Cleaning System – Cleaner, more efficient cooling. Longer engine life.

Hydrostatic Drive – Cutter speed independent of ground speed. Variable forward and reverse controlled by single pedal. No clutching.

Two-Speed Transaxle – Dual speeds. Low 0 to 4.6 mph. High 0 to 8.8 mph.

System Implements – The Turfcat II system includes: 50", 60" and 72" rotary decks, 50" and 60" flail mowers, rotary brooms, plow, snow thrower and grass catcher.

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Jacobsen. Engineered from the ground up.

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GOLF UPDATE

Palmer first to receive Morris Award

Arnold Palmer will be the first recipient of the Old Tom Morris Award to be presented at the 54th International Turfgrass Conference and Show in Atlanta, GA, Feb. 19-25, sponsored by the Golf Course Superintendents Association of America. The award has been instituted to recognize "an individual whose selfless commitment to the game of golf has helped further its welfare in a manner exemplified by Old Tom Morris," one of golf's foremost enthusiasts.

The award presentation will be only one highlight of the conference, which this year has also expanded its seminars, programs for spouses and initiated an open meeting for the GCSAA memebership-at-large. The open meeting is scheduled for Feb. 13, and will provide an open forum for the membership to discuss business, analyze the dues structure and membership concerns.

Jim Prusa, director of education, said this year's conference will concentrate on providing a show for everyone in the turf industry.

Keynote speakers for the conference have not yet been confirmed.

Delta Airlines is offering a 30 percent fare reduction to conference-goers. By calling toll-free, 1-800-241-6760, plane reservations, car rentals (also at a discount) and post-conference vacations can be arranged.

Forum points to golf "golden age"

Research and presentations from the National Golf Foundation's recent Forum of Golf indicate golf will continue moving toward a new "golden age" in the United States, effecting every aspect of the sport and industry.

During the second quarter of 1982, the NGF recorded an 8.5 increase in the percentage of rounds played since 1978 among the country's 17.37 million golfers. Such statistics promoted the "cautious optimism" that prevailed at the NGF's second annual Forum of Golf in Palm Beach Gardena, FL in October, according to Mark N. Boorman of the NGF.

"This year we noted a definite change in attitude from negative to positive among members concerning the Foundation's three areas of concern; golfers, golf facilities and rounds played," Boorman noted.

The four-day forum highlighted 20 speakers addressing all aspects of the industry including golf course maintenance, management, attitudes toward the game and the future of the industry. Among the speakers were four of the country's foremost golf architects, Jack Snyder, Geoffrey Cornish, Bill Amick and Dick Phelps. David Hueber, director of special projects for the PGA Tour, discussed the Wee Links concept of golf courses for junior golfers and Joe Moresco, head pro at Woodmere Country Club on Long Island, NY, addressed one of the more controversial topics in golf pertaining to creating a new set of women's tee markers to make golf courses fairer, not only for women, but for seniors and the infirm as well.

Frank Smith, president of the NGF said the second forum was so successful he plans to make next year's the largest annual meeting in golf.

NEWS *from page 8*

GOVERNMENT

Report due soon on extension's future

A report will be forthcoming soon on the findings of a federally-appointed national committee formed to determine the future of cooperative extension in the United States.

The formation of the 21-member committee was prompted by accusations from the American Farm Bureau and other national farm organizations that the Cooperative Extension Service has not had sufficient budget or staff to expand its programs into urban areas, thus diluting its programs to serve only farmers and those living in rural areas. Groups such as Gardens for All and urban dwellers feel the Cooperative Extension should continue to service the people where they live—in the urban areas.

Daniel Aldrich, Chancellor at the Univeristy of California-Irvine appointed co-chairman of the committee by U.S. Secretary of Agriculture John Block and Robert Clodius, president of the National Association of State Universities and Land Grant Colleges, said three major factors influenced the committee's research: the changing needs of counties in America more than in previous decades, changes in technology, media and communications, and the degree of control exerted by federal and local governments and state universities on the Extension programs.

In its research, the committee has taken into consideration questions and concerns sent to them from professionals in the industry and from the private sector.

TREES

Penn State "first" protects Douglas firs

A discovery by the Penn State Department of Agriculture could help protect new plantings of Douglas fir trees against gypsy moths.

Forest scientists at Penn State have discovered gypsy moths prefer some strains of Douglas firs because of the aroma of sap, or "terpenes" in the needles.

Edgar H. Palpant, research assistant in forestry at Penn State, said the discovery could help protect new plantings of resistant trees in plantations currently worth over $75 million in Pennsylvania alone.

Palpant and his associates recom-

Continued on page 14

More proof that Eclipse is the quality Kentucky bluegrass that's a shade better...and better in the shade! In a three-year bluegrass shade study conducted under natural shade of locust and cherry trees by the Virginia Polytechnic Institute, only Eclipse was rated best in shade performance each year of the test.

Low growing, dark green, disease and insect resistant, Eclipse is the ideal base for sod blends and turf seed mixtures for golf courses, parks, playing fields, and home lawns, coast to coast.

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LANDSCAPE UPDATE

ALCA plans financial seminars

Two more financial management seminars have been planned by the Associated Landscape Contractors of America after the success of two new similar workshops in September and October.

Seminars have been scheduled for Feb. 16 in Phoenix and Feb. 28 in Chicago.

The continued emphasis on planning for the financial future in the landscape industry was the focal point of the two seminars held recently; one in San Francisco in September and the other in Dallas in October. Both seminars were presented by Jim Skelton of Ross/Paine and Associates, a financial consulting agency based in Chicago.

The two citys' "Pricing for Profit" seminars attracted over 60 landscape professionals. The program developed specific financial strategies for the landscape contractor and defined and examined ways to increase profit in today's economy. Areas covered were evaluation of income statements, forecasting, ways to plan for future growth and budgeting, profit centers, profit performance and pricing strategy.

ALCA Director of Programs Gail Morgan said the increasing concerns of the landscape industry in profitability and marketing in today's economy have made the financial management seminars valuable to anyone working in the landscape industry.

IPA honored 17 at Annual Meeting

The Interior Plantscape Association acknowledged 17 designs in three categories at its Oct. 26 Annual Meeting and Trade Show.

Judges for this year's awards included Jacob Kaminsky, landscape architect from Columbus, MD; Darwina Neal, a landscape architect from Washington, D.C.; and Marge M. Talt, an interior designer from Potomac, MD.

Winners were judged in the following categories:

Design Installation: Madelyn Simon of Madelyn Simon & Associates, Inc. of New York, NY; James E. Richardson of Green Expectations, Inc., Dallas, TX;

Leonard A. Kersch of Garden Milieu, Inc. of Ann Arbor, MI; John Mini of John Mini Indoor Landscapes, Ltd., City Island, NY; Mark Morrison of Haines, Lunberg and Waehler, New York, NY; Steven Arkin of New Growth

Plantscape, Ltd., New York, NY; Raymond L. Brooks of Plant People, Phoenix, AZ; and Elaine F. Wilson of The Plant Place, Philadelphia, PA.

Maintenance: John Mini of John Mini Indoor Landscapes, Ltd., New York, NY; Raymond L. Brooks of Plant People, Phoenix, AZ; and Dagny DuVal of Plant Specialists, Inc., New York, NY.

Residential: Leonard A. Kersch of Garden Milieu, Inc., Detroit, MI; and Linda Trinkle Wolf of Interiors That Grow, Scarsdale, NY.

Merit Award Winners: James E. Richardson, Green Expectations, Inc.; John Mini, John Mini Indoor Landscapes, Ltd.; Steve Arkin, New Growth Plantscape, Inc.; Raymond L. Brooks, Plant People; Elaine F. Wilson, The Plant Place; Leonard A. Kersch, Garden Milieu, Inc.; and Linda Trinkle Wolf, Interiors That Grow.

NEWS *from page 12*

mend planting resistant strains of Douglas fir from seed originating in Colorado, Arizona or New Mexico.

"That's the southern range of this tree that ranks second in popularity among all Christmas trees in the nation," he commented. "On the other hand, trees grown from seed originating in British Columbia, Washington, Idaho or Montana are like cake and ice cream to the gypsy moth larvae." Palpant said the resistant trees are the bluish-colored strains common in the southern range of Douglas fir country. Strains damaged by the larvae are the gray variety common to areas of the Pacific Northwest.

Research has shown the larvae are attracted to the trees from the scent of a series of substances called terpenes, part of the liquid mixture that makes up the sap in evergreen trees. Small amounts escape from the needles and attract gypsy moths. Palpant believes some terpenes are repulsive to the gypsy moth larvae. He said other scientists found that three terpenes reduced feeding by larvae at 0.2 percent concentrations.

The scientists first noted the peculiar feeding choice of gypsy moths in 1980 when very young larvae were sucked into a closed greenhouse through the ventilating system. They were deposited randomly among young Douglas firs seedlings. Only seedlings from certain geographic origins were eaten.

Drs. Paul Heller and David Shetlar of the Department of Entomology verified the observations and their analysis continued to point to gypsy moth preference for plants from the Pacific Northwest seed origins. Further experimentation upheld the early findings.

"Our research should serve as a guide to Christmas tree growers in managing Douglas fir plantations," Palpant commented. "If susceptible varieties are grown in the future, because of other favorable traits, then growers will know they must spray with insecticides."

SIX AWARDS

Horticultural Society honors Disneyland

Six people involved in horticulture and a landscape staff were honored at the 1982 American Horticultural Society's 37th Annual Meeting in October in Cincinnati. Among those being honored were:

Fred C. Galle, awarded the Liberty Hyde Bailey Medal, the most prestigious annual honor given in American

Continued on page 16

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GOVERNMENT UPDATE

Government workers push laws to discourage outside contractors

Government employee unions are fighting hard to push through Congress a bill which would require bidders on Defense Department contractors to pay the cost of a study to determine whether private industry or government workers can do the job cheaper. The added cost of the study could swell proposed bids on jobs to the point where contracting out would not be competitive.

If successful, other agencies would be next. These unions are better organized than many of the groups pushing for contracting out and with a membership of almost one million employees they carry a lot of clout at election time. If they didn't get what they wanted in the last Congress you can be sure that they will be back when the new session begins in January 1983.

It also appears that the White House, which wanted to save $1 billion worth of activity now being performed in-house, doesn't care if the contract goes to private contractors or is saved by higher in-house productivity. When it came time for the budget fight, the $1 billion was small when compared to other items and was overlooked. Private business thinks that the Administration could have pushed for contracting out more with Congress.

Gypsy moth quarantine might extend to moving companies

The American Association of Nurserymen told the Office of Management and Budget that nurserymen are still interested in an effective gypsy moth quarantine program. OMB is doing a study on how a quarantine would function and what it would cost.

One possible result of a quarantine program if implemented would be more restrictions on moving companies. Outdoor furniture, firewood, and doghouses would have to be inspected and certified free of gypsy moth egg masses or the moving company would refuse to load them on trucks. USDA would publish pamphlets for moving companies. Restrictions would apply in areas of heavy infestation where people are moving out.

Servicemen exception made for child-resistant residential pesticides

The Environmental Protection Agency (EPA) finalized rules for incorporating child-resistant packaging to pesticides designated for residential use. Pesticides which carry the signal words, DANGER or WARNING, or are especially corosive to the eyes or the skin will need special packaging to protect children and adults from injury due to accidental ingestion of the chemical.

In order to pin-point the formulations used by commercial applicators, such as ornamental trees, shrubs, flowers, turf and lawn maintenance personnel or exterminators, EPA has exempted registrants who limit their products to sale, use and storage by "servicepersons" from the packaging requirements. *These words must be prominently displayed on the label.* An individual homeowner is not a serviceperson. There are both civil and criminal fines for misuse of such chemicals.

NEWS *from page 14*

horticulture. Galle is curator at Callaway Gardens, Pine Mountain, GA, and has been in horticulture the past 40 years. Galle writes frequently on horticultural topics and is currently editing the "Azalea Book" by Frederic P. Lee.

Eliot Wadsworth II was awarded the Commercial Citation. He is owner of White Flower Farm Nursery, one of the finest perennial nurseries in the country. The commercial citation is given to an individual whose commitment to the highest standards of excellence in the field of commercial horticulture contributes to the betterment of gardening practices everywhere.

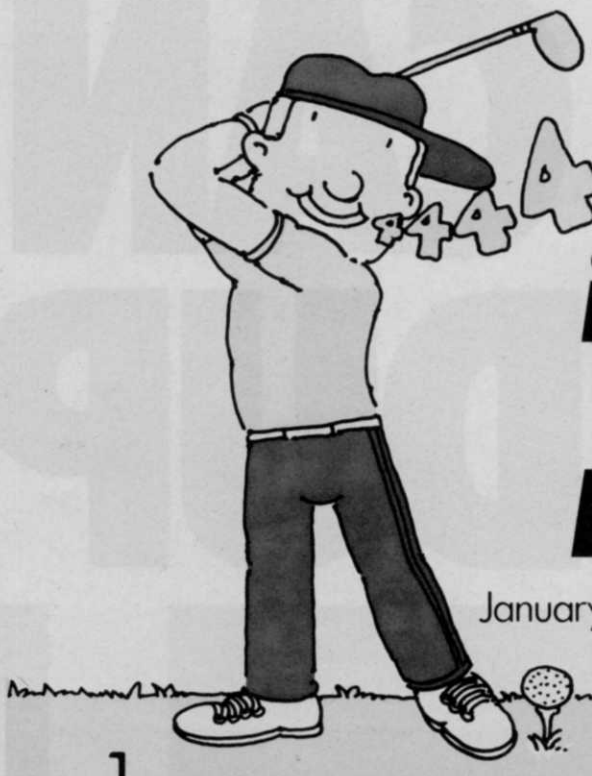
Robert Smaus received this year's Writing Citation. Smaus is associate editor of the Los Angeles Times Home Magazine and is a former contributing editor of Sunset magazine.

The Landscape Staff at Disneyland in California received this year's Landscape Citation, given to those whose work in landscape architecture or design contributes to a better awareness of the field of horticulture. The Disneyland landscape staff of 49 maintains seven acres of flowerbeds filled with 800,000 annuals, three acres of turf and nine acres of shrub areas, as well as 2,500 trees and a sizeable amount of topiary, all grown on the premises.

Marlene Holwadel received the Society's first Local Horticulture Citation, given to an individual or group who has contributed to the improvement of horticulture in the host city for the Society's Annual Meeting. As one of the two founders of the Cincinnati Park Board Volunteers in 1971, Holwadel started the gift shop in the Krohn Conservatory and developed guided tours of both the Conservatory and the Mt. Airy Arboretum. She and her volunteers have contributed plants to the conservatory and have made a number of important physical improvements to the Conservatory's buildings.

Jane Steffey, the Society's Horticultural Information Service Director, was awarded the Meritorious Service Award for her 11 years of volunteer work in various capacities for the Society.

Donald Egolf, a research horticulturalist with the U.S. National Arboretum, was given this year's Professional Citation. Egolf has introduced 30 new cultivars since 1958. He has received numerous awards and is credited with making the breeding program at the U.S. National Arboretum one of the most comprehensive of its kind in the world.



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COMPACTION - PART 3

SOILLESS GREENS MEAN LESS COMPACTION AND BETTER TURFGRASS

By RON FREAM

No amount *of maintenance can correct severe compaction problems. Redesign and rebuilding may be necessary.*

Greensites receive more turf management attention in response to compaction than do tees. Successful consideration of greensite design should provide for playability, challenge and variety, beauty, proper subsurface drainage, the correct seedbed mixture, environmentally adapted turfgrass varieties, and efficient long-term maintenance.

One profound misconception about greens is grass cannot grow without "soil" or "topsoil". In fact, the less soil in a putting surface seedbed, the better. It has been the word of various august authorities that soil must be part of the putting green seedbed mixture. Practical, in-the-field results have just as vigorously demonstrated that less soil equals better turfgrass.

Where custom, habit or misconception have encouraged the construction of putting greens entirely of locally available "soil" or "topsoil", greens of varying degrees of playability - from outstanding to miserable - are the result. Certainly, at various times of the year, even clay-based greens can appear healthy and vigorous. Outstanding examples of fine old soil greens can be pointed to, generally at courses where the climate is mild and golfer traffic is light.

Any putting green should look good when climatic conditions are at their optimum and play is at a minimum. It is what happens after an extended rainy period or when the temperature shoots rapidly upward to bake the putting surface or when 225 rounds of play per day occur for long, continuous periods that the problems become apparent.

Design

Before seedbed materials are either specified or delivered to the jobsite, the design of the greensite should be carefully considered. The majority of greens in the world are round or nearly so. Attractive putting greensites with individual appearance and character are not prohibited in the rules of golf. It only seems that way when so many greens offer no diversity, drain only to the front and are framed by two cashew or almond shaped sand traps.

The design of the greensite must allow for reasonable access by golfers and maintenance equipment. When the sand bunkers block or restrict access to limited or narrow areas, compaction problems are sure to follow. Greens with only one limited route of access will have severe compaction problems no matter how intense the maintenance effort to counteract the traffic.

Sand bunkers, lakes or other hazards are a natural and normal feature around many greensites. Their presence is both necessary and desirable. However, when designing the greensite and its associated protective or challenging hazards, an awareness of the potential problems of inadequate access or insufficient equipment turning area must be considered.

Providing a diverse greensite shape, with varying adjacent hazard placements, will permit the turfgrass manager to change pin positions frequently - daily with heavy play - to assist in moderating the impact of golfer traffic on any particular portion of the putting surface. Changing of pin positions also assists in dispersing traffic on the putting surfaces.

Although putting surfaces must be large enough to offer several distinct pin placements, excessively large putting surfaces can be wasteful of construction and main-

tenance funds.

Exaggerated putting surface contours, which restrict usable pin positions can contribute to excessive traffic over limited areas of a seemingly large greensite. Subtle to dramatic contours have their place and position. The individual approach shot to each greensite should basically define the surface contours desired and the arrangement and use of hazards.

Surfaces with several drainage flow outlets help to minimize future compaction problems. Frontal drainage into the approach area must be avoided whenever possible. Putting surfaces of around 4000 square feet (380 square meters) to 8000 square feet (750 square meters) are a generally logical size range.

The designer's impact upon longterm greensite maintenance is very real and very lasting. There is more to consider in the design of a greensite than just how the 4 iron should be hit into the green. Maintenance can be directly affected by greensite design. Turning space off the putting surfaces for mowers and other equipment is vital. Bunkers or other hazards must be positioned with this fact in mind. Tight convolutions of the green surface shape can encourage wheel compaction by triplex greens mowers. Poorly considered contour changes which are too abrupt can contribute to scalping.

Seedbed Components

Longterm greensite seedbed mixture components should be carefully considered and carefully specified.

Mixing of a coarse aggregate-organic humus, a medium aggregate-sand and a fine aggregate-soil together approximates the recipe for concrete. The very last thing a putting green needs is a compactable seedbed. Every putting green needs a deep, well-drained seedbed.

A golf course architect knowledgeable in soil science should be able to prepare a precise, concise set of specifications which will direct the preparation of a well-drained, water-retaining, compaction resisting seedbed.

Subsurface drainage within the putting surface area is unnecessary only when constructing a greensite on a pure sand natural site. The total volume of drainage pipes within the area of the putting surface would vary as subgrade conditions and local climatic factors determine. In general, 350 feet (110 linear meters) or more of four inch (10cm) diameter perforated drainage line is perhaps "average" for a greensite. Discharge of subsurface drainage lines and surface flow, as well, should be directed away from primary golfer entry or exit paths. Drainage line outlet points should be well away from the fairway area. Yet, all too often, the putting surfaces only slope to midcenter front, directly into the fairway approach and traffic area. Subsurface drainage lines, if used, frequently discharge a short distance in front of the putting surface, again in the fairway approach. Is it any wonder that soggy areas develop just where all the golfers converge and the maintenance equipment makes it turns when such a procedure is followed?

Any green should look good when weather is nice and play is slow.

The type of gravel for encasement of perforated drainage lines and the gravel layer beneath the seedbed mixture (for teeing surfaces and for putting greens) should be carefully selected. A uniform particle size distribution is recommended. Fine gravel, pea-gravel or similar, is recommended. A gravel having a particle size distribution between 6mm (0.25 inch) and 18mm (0.75 inch) is quite ideal. Large diameter gravels, in excess of 25mm (1 inch) generally have interspaces which will permit a filtering down of the finer textured particles from above or the native soil adjacent. The filtering-in can, in time, result in clogging of the drainage passages. Crushed gravel is as usable as natural "river-run" rounded particles so long as the size distribution range is within the desired tolerances.

If only very coarse gravel is available, an intermediate layer of coarse sand or polyester filter cloth may be necessary to separate the sand-humus layer above from the gravel below.

Well-washed gravel, free from silt and clay particles, is important. Gravel contaminated with silt and clay will soon inhibit proper water flow. The gravel layer should extend fully beneath each putting green seedbed mixture to the limits of the putting surface. A uniform layer, four inches (10cm) in thickness, is to be considered the minimum depth.

The lack of drainage lines and gravel layer beneath the seedbed will result in soggy and puffy drainage areas both at the putting surface edge and into the apron area - a sure invitation to compaction. It is not a wise economy move to dispense with subsurface drainage lines within the putting surface. Poor drainage induces compaction more rapidly than any other causative agent.

It has been noted that soil in any form is not recommended for inclusion within the putting green seedbed mixture. The sought after mixture should be one which is comprised of only select sand and organic humus. What is select sand? The generally recommended particle size range for putting green seedbed purposes would be a sand which provided more than 80 percent by volume between 0.20mm and 1.20mm particle size range. From 1.20mm to 1.60mm and from 0.20mm to 0.10mm can comprise another 5 to 10 percent each. Less than 5 percent in total should consist of combined silt and clay particles and very fine sand (those particles smaller than 0.10mm). The "ideal" sand would be one with a uniformity of particle diameter around the 0.50mm size range. The more consistent and uniform the particle size, the more resistant it will be to compaction problems. The major determining factor must be the combined clay and silt content. It is these fine textured materials which will plug up the coarser materials and assist directly in helping to induce the compaction problems. Insist on water washed,

clean sand, as free as possible of silt and clay.

If given a choice, a more coarse sand should be preferred over a finer one. Ordering sand by a type or local-use name is not advised. What is "plaster sand" and acceptable in one locality may be called "plaster sand" in another area but consist of 20 percent unacceptable fines, as an example. Select the sands using mechanical sieve analysis to insure proper sizing and particle distribution. In some situations, even a chemical analysis of the proposed sand should be undertaken before the final selection is made to screen for salts or other contaminants.

The organic humus component of seedbed mixture can be quite diverse in origin. The humus material is included primarily to act as a "softening" agent to provide resiliency and to prevent the sand from being too hard in the first year or two of play and to act as a water retaining medium. Once the turfgrass is established, the normal root system regeneration will provide adequate humus.

Peat moss, ground pine or fir tree bark, rice husks, composted animal manure, grape and olive pomace, cocopeat, bagasse and similar sources of organic humus have been successfully used. Whatever organic material is locally available, so long as its chemical analysis is favorable, may provide the organic portion of the seedbed mixture. Particle size range is not as critical as for sand. A particle size providing 80 to 90 percent passing a 6mm (0.25 inch) screen is generally sufficient and usually available.

The porportions of sand to humus will vary depending upon the sand particle size distribution, type of humus, local climatic conditions (primarily rainfall) and organic material accessibility. In general, a ratio of 70:30 to 85:15, sand:humus has been proven to be quite successful. The seedbed mixture should be thick enough to provide ample waterholding capacity and deep root growth. A thickness of 12 inches (30cm) would be recommended as a minimum inplace thickness.

The seedbed mixture must be completely, thorougly and totally pre-mixed before placement on the individual green or tee surface. Only under rare conditions and specific situations should in-place, on site mixing of the sand and humus be permitted. Inadequate mixing will lead to problems of layerage, poor water movement and potential soggy problems.

Always select and use the finest quality seed or vegetative stolons available. Weed-free, certified clean seed of the latest crop is essential. Cheap seed is never a bargain. Vegetative stolons should be obtained from reputable sources with assured varietal quality.

Once the greensites have been constructed, do not make the common mistake of topdressing the turf surfaces with a mixture containing soil. If the seedbeds were constructed properly; that is, without any soil in the mixture, then using soil in the topdressing will only induce and promote the very problems the soil-free seedbed mixture was designed to prevent or counteract. WTT

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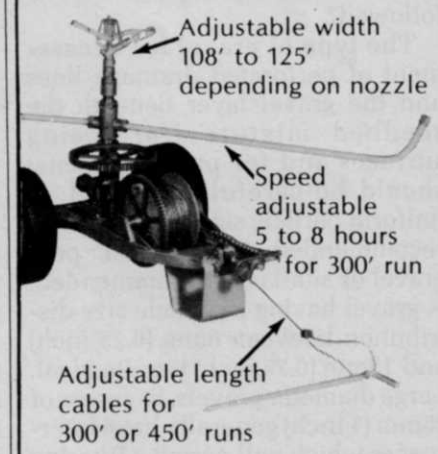

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REGIONAL TREE TYPES INCREASE WITH CHANGES IN PROPAGATION

By DOUGLAS CHAPMAN

As tree production in the nursery becomes more complex, we the users, should stay abreast of current production techniques. Graft incompatibility or incongeniality became a significant problem during the last 15 years.

Davidson at Michigan State University first noted a problem with Red Maple (*Acer rubrum*) in 1965. The symptoms included early fall color (late July), vertical or longitudinal cracks in the trunk, and, finally, sudden collapse during mid-summer of the tree. Since his original determination, graft incompatibility has been confirmed on 'Sovereign' Pin Oak (*Quercus palustris* 'Sovereign'), numerous Red Maple cuttings, 'Rosehill' White Ash (*Fraxinus americana* 'Rosehill'), 'Autumn Purple' White Ash (*F. a.* 'Autumn Purple'), 'Bloodgood' London Planetree (*X Platanus hybrida (acerifolia)* 'Bloodgood'), and excessive suckering on 'Greenspire' Littleleaf Linden (*Tilia cordata* 'Greenspire'), to mention a few. A way to overcome this problem is to change the method of propagation. This change could be seed propagation, propagation by cuttings, or tissue culture.

Seed propagation has been and remains a valid technique. Obviously, the trees grown from seed don't have incompatibility as a problem. But the real reasons to move to propagation by grafting or budding included development of cultivars or superior trees, more uniform trees, lacking the genetic variation (one would expect from seed propagation), decrease production time (holding down the cost of tree production).

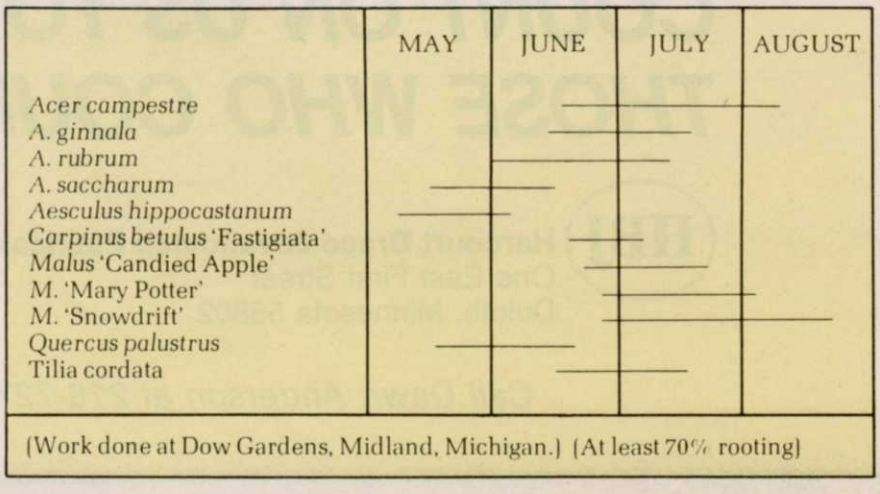
Propagation by seeds, especially seeds from your region of the country, e.g. Great Lakes States, Northeast, Southeast, is a valid technique where local adaption would be considered. Local adaptation, or provenance is the genetic adaption of trees to specific regions of the country. Red Maple is native from Northern Michigan to Northern Florida, but a Northern Michigan Red Maple would not survive in Florida, nor would a Florida native survive in Northern Michigan. It is, therefore, important to know the seed source. Further, it is important that this provenance be considered not only in seedling grown trees but also in the development or regional cultivars.

Propagation of trees by cuttage is a relatively new phenomenon. This is accomplished by simply taking a cutting of a desired tree or cultivar, sticking it in the propagation media, misting, and/or some other technique. Multiple propagation from sucker pieces of *A. rubrum* was first reported by Orton of Rutgers University. His work showed that one could take sucker pieces that develop on young trees and propagate the cultivars under mist and develop a viable root system and, therefore, total plant. His technique was unique in that more than one cutting was taken from each stem piece.

We, at Dow Gardens, initiated propagation studies aimed at production of Red Maple, Sugar Maple (*A. saccharum*), Hedge Maple (*A. campestre*), Common Horsechestnut (*Aesculus hippocastanum*), crab apple cultivars, hornbeam, oak, and linden. These studies have been ongoing since 1978 and reported in the proceedings of the International Plant Propagators Society. If the cuttings were taken at the right time, using the correct media, and other unique conditions, one can propagate cultivars of Red Maple, Sugar Maple, Hedge Maple, 'Mary Potter' Crab Apple (*Malus* 'Mary Potter'), 'Snowdrift Crab Apple (*M.* 'Snowdrift'), 'Candied Apple' Crab Apple (*M.* 'Candied Apple'), 'Fastiagata' European Hornbeam (*Carpinus betulus* 'Fastiagata'), Little Leaf Linden (*Tilia cordata*), and Pin Oak (*Quercus palustris*) by softwood cuttings. Further, a nursery in Ontario is

TABLE 1

Time to Take Softwood Cuttings, North Central U.S.



(Work done at Dow Gardens, Midland, Michigan.) (At least 70% rooting)

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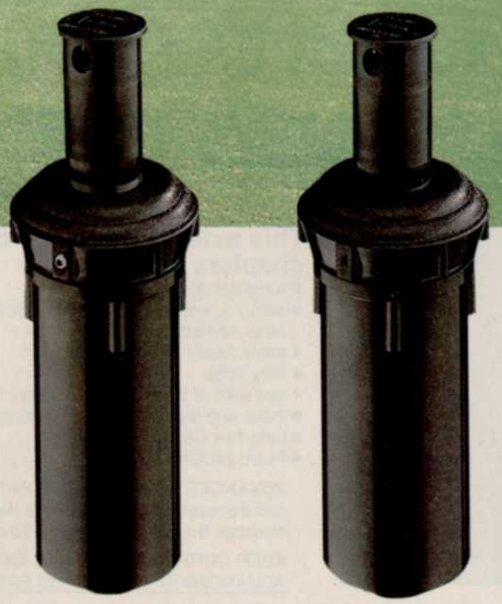

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propagating Paperback Maple (*A. griseum*) by softwood cuttings and Ed Mezitt at Weston Nurseries, Hopkinton, Massachusetts, has been successful in propagating Japanese Maple (*A. palmatum*) by cuttings.

From some work done by Dirr, while at the University of Illinois, on crab apples, it would seem that timing of softwood cuttings was important. We tested this hypothesis and wholeheartedly concur. The chart suggests when to take cuttings of varieties of trees (under Midland conditions).

Tissue culture is another tool used in asexual propagation, or cultivar propagation, of trees. Sink at M.S.U. has been a leader in the development of tissue culture of *A. rubrum*. It is our hope, he will continue to work with various ash species, which we have had no success by using the cuttage technique, and the various oaks, e.g. White (*Q. alba*), Scarlet (*Q. coccinea*), and Bur Oak (*Q. macrocarpa*).

How does this affect the ultimate user, the urban forester, the landscape architect, and the landscape contractor? These developments in propagation mean that the problems we have noted in the past, related to graft incompatibility, can be overcome. Trees will be growing on their own root system, and, therefore, problems of rejection, incompatibility, or incongeniality (whatever term you want to use) would be eliminated.

Propagation changes allow more regional plants, higher resistance and greater urban tolerance

Further, it gives us an opportunity to have regional cultivars, that is plants native to a region of the country, that have been selected for disease resistance, environmental tolerance, or aesthetics, would be propagated and grown by our local nurseries. This will increase the diversity of plants available for landscape use, while fine tuning, if you will, quality trees for our difficult urban conditions. Specifically, diversity will result in increased environmental tolerance, while reducing maintenance requirements, insect and disease effects, and the need for supplemental water and fertilizer with the end product—healthier landscapes.

Presently, there are a significant number of nurseries offering trees propagated by cuttage. These include Frank Schmidt and Sons, Oregon; William Moller, Oregon; Lake County Nursery Exchange, Ohio; ('Bloodgood' London Planetree); and Weston Nurseries, to mention a few. These significant developments should help you, the designer-manager, or installer of landscapes, to select healthy, vigorous trees that will be best adapted for your unique landscape. **WTT**

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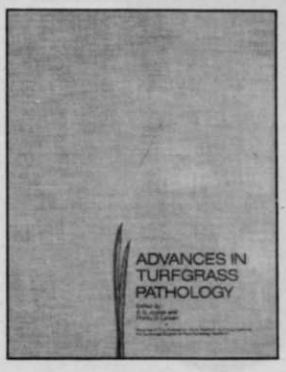

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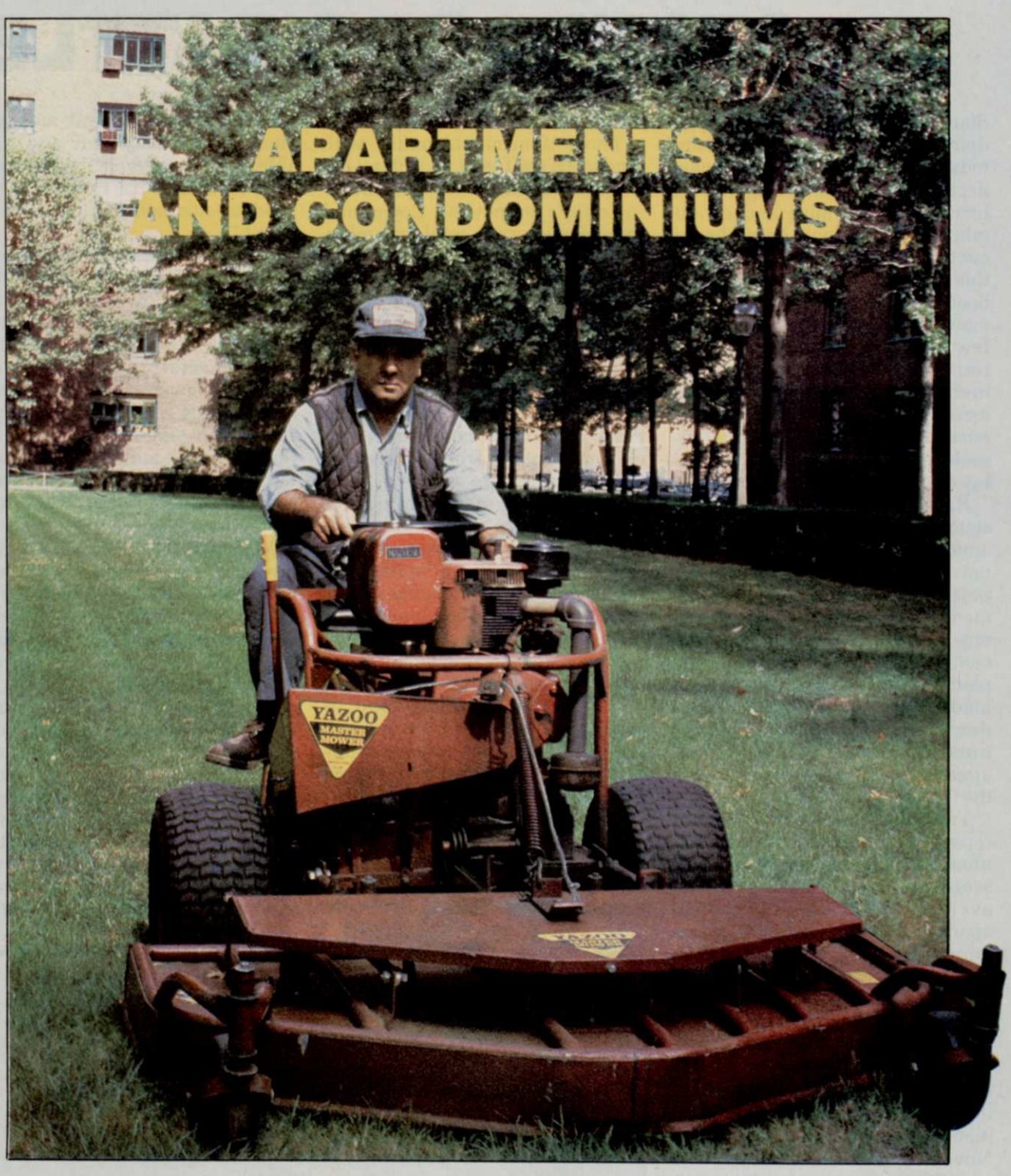
LANDSCAPE MANAGEMENT



WEEDS TREES & TURF

Research in LANDSCAPE MANAGEMENT

CONDOMINIUM MARKET FACES COST vs STANDARDS BATTLE

Standards for apartment and condominium landscapes are rising today while more of the landscape decision-making is falling into the hands of cooperative and condominium associations. As landscape contractors sense the potential of this growing market, association boards are contemplating in-house maintenance programs. Since very few (less than 25 percent) of those responsible for landscape management belong to a landscape association, resolving the differences between contractor and association board will be on a case-by- case basis.

Rising landscape standards stem from increasing competition among apartments and condominiums. "Curb appeal" may draw a potential tenant to one development over another. All respondents in *Weeds Trees & Turf's* recent survey agreed residents are placing an increasing value on the landscape of apartments and condominiums. They also see the number of condominiums and apartments increasing greatly in the future.

Two thirds of the respondents reported the apartment/condominium staff performed some landscape services. To maintain an average of 16 acres the typical apartment/condo owned 2 riding mowers, 5 push mowers, 2 line trimmers, 2 spreaders, 1 tractor, 1 spray unit, and 2 chain saws. This machinery is operated by 3 full-time and 3 part-time personnel. The average chemical budget was $2,800 and the average equipment budget was $3,500. Most budget planning is done in October and November. More than a fifth of the respondents said there was no separate budget for landscaping.

Equipment buying is done primarily on an as needed basis. Chemical buying takes place primarily in February through April.

Those apartment/condos with landscape staff tend to contract out chemical applications, concentrating efforts on mowing, flower and groundcover care, and trimming. Tree planting and seeding are the second most common functions performed by contractors for apartment/condos.

A fourth of the respondents purchase chemicals and seed supplies from local garden centers rather than specialized wholesale distributors. Equipment, however, is purchased largely from landscape equipment dealers.

More than a quarter of the respondents were owners of apartment buildings. Landscape responsibility falls chiefly in the hands of the building or maintenance supervisor. In the case of condominiums, members of the association board review landscape programs.

The contractor or the supervisor of the landscape staff tend to specify the work. The owner and the maintenance supervisor depend upon these people for setting guidelines and budgets.

Communication and tact in dealing with residents are the two most critical keys to successfully working for an apartment/condo. "The landscape staff has to work closely with the residents and management, be conscientious and reliable," one apartment owner said. "The landscape has to show to the resident attention to trimming and detail."

On the other hand, management is leaning toward in-house landscape staff to lower costs and increase control, according to the survey. While standards are going up contractors' prices must increase to cover higher standards. One solution is to have apartment/condo staff take care of trimming, flower beds, and groundcovers, while the contractor performs mowing and chemical applications.

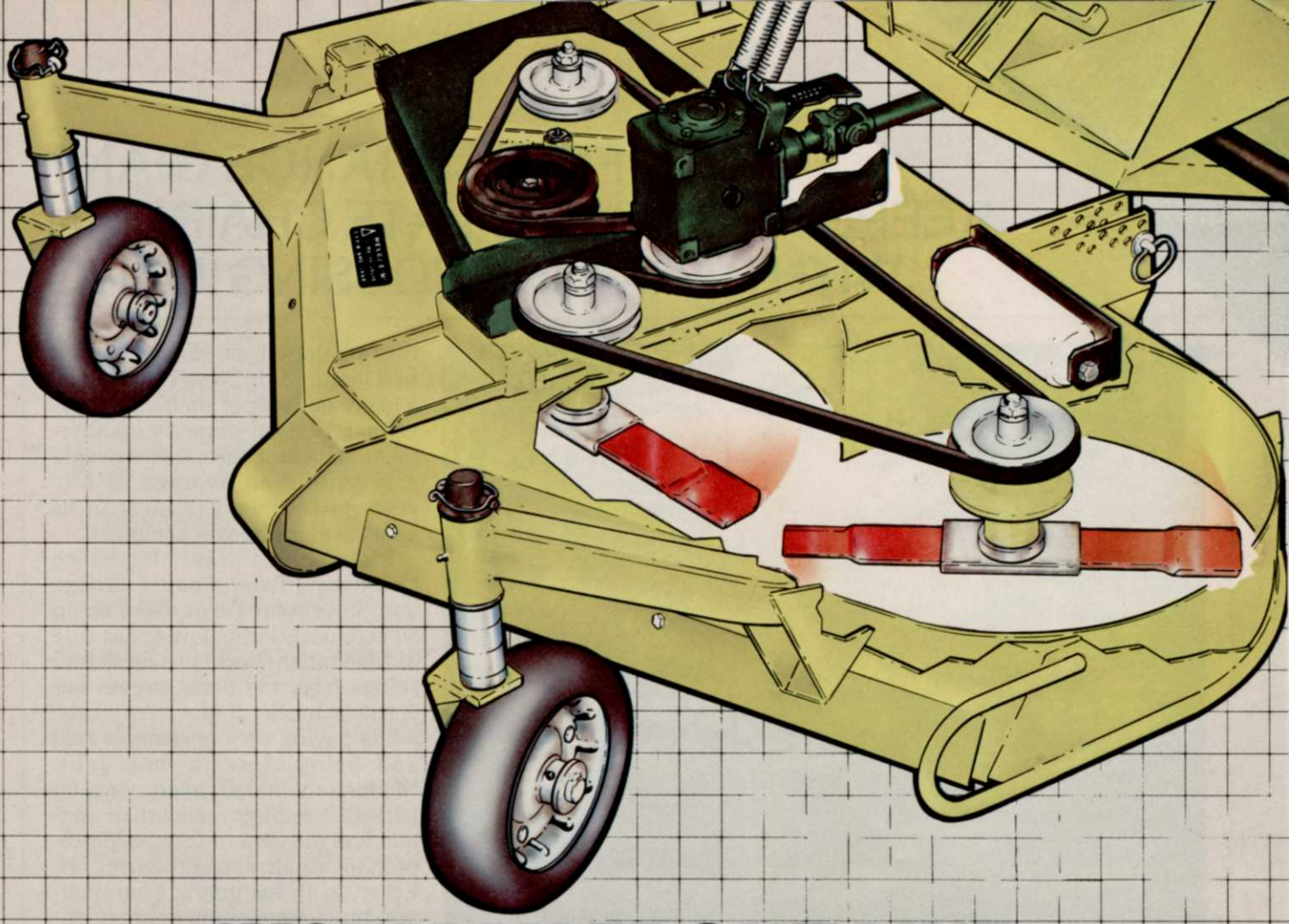
Metropolitan Insurance Co., owner of apartments in New York City, contracts all the work out to avoid labor relations problems with the union. At the same time, Metropolitan supervisors direct the contract staff.

Landscape supervisors of apartments and condominiums should join associations to help work out some of the potential differences between costs and expectations. The number of apartment/condo units will rise in the 80's as will the landscape standards. Associations are the best way to work out necessary compromises. **WTT**

TABLE I

Who Performs Landscape Services

Service	by Apartment/Condo	by Contractor
mowing	60%	40%
trimming turf	66%	34%
fertilize turf	50%	50%
turf weed control	55%	45%
turf insect control	55%	45%
tree spraying	80%	20%
tree trimming	75%	25%
groundcover/flower care	90%	10%
tree planting	66%	34%
turf seeding	66%	34%
turf aerifying	70%	30%



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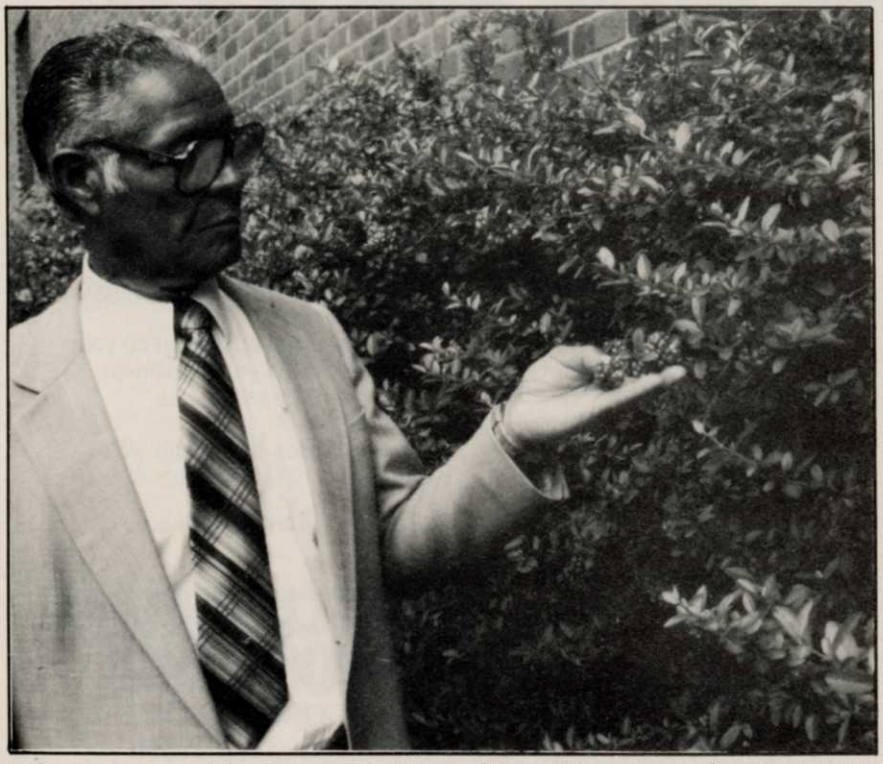
Profiles in LANDSCAPE MANAGEMENT

LIFE INSURANCE GIANT KEEPS PROMISE TO LATE CHAIRMAN WITH PARK-LIKE HOUSING IN NYC



Robert Mero *(top) has managed Metropolitan's 80-acre complex since 1973. Park-like central oval of Stuyvesant Town (bottom).*

Being selected as one of the ten best landlords in New York City by a major newspaper should be proof enough of good property management. The fact that 11,000 people are waiting an average of five years to become a resident of its apartment complexes clinches it.

Metropolitan Life Insurance Company's Peter Cooper Village and Stuyvesant Town make up an 80 acre oasis in the lower east side of Manhattan. Residents there find refuge from the noisy streets and constant hustle of New York City, while paying very reasonable rent and being close to their jobs. Moderately-priced apartments in park-like settings near urban centers was the idea of former Metropolitan Chairman Frederick H. Ecker. With his urging Metropolitan built large apartment complexes in Los Angeles, San Francisco, Alexandria, VA, and New York City in the 30's and 40's. Metropolitan has since sold all but the two in New York City.

Bob Mero, a graduate horticulturist from Virginia, joined Ecker's housing group in 1947 as superintendent of grounds operations at Metropolitan's Riverton apartments in upper Manhattan. While he was at Riverton, Metropolitan started demolition of 80 acres of tenement housing in lower Manhattan. It amounted to privately-funded urban renewal. The area, known as the Gas House District had also been the storage area for oil companies in Manhattan. As a result, the soil was saturated with oil.

The landscape of Peter Cooper Village and Stuyvesant Town became Mero's responsibility in 1973. The two complexes include 64 wooded acres spread between 110 buildings containing 11,250 apartments. There are 26 acres of turf, 9 acres of groundcover and hedges, and 25 acres of pavement and sidewalks. Fifteen playgrounds are

distributed throughout the two complexes.

The contrast may be hard to imagine if you've never experienced New York City. You might expect all residential areas to have tree-lined walks, parks with fountains, squirrels racing from tree to tree and birds singing. In New York City, such an environment is hard to find at any price. Furthermore, Metropolitan has kept its promise to former chairman Ecker by keeping rents far below the norm.

Mero has a maintenance staff of 40 union workers under a contract with National Cleaning Corp. All 40 work full-time, year-round for Metropolitan. Mero's grounds and garden supervisor Marty Mirione is the immediate supervisor of landscaping.

The original oil-soaked topsoil was removed and replaced before planting began. Much of the green area is above parking garages. Landscape architects Clark, Rapuno, and Holleran specified five major trees, five minor trees, four types of hedge plants, four types of vines, four types of groundcover, and 16 types of shrubs. The plant list reads like a nursery catalog; 600 *Platanus orientalis*, 500 *Quercus palustris*, 320 *Gleditsia triacanthos*, and 250 *Liquidambar styraciflua*. Magnolias, crabapples, cherry trees, *Crataegus*, and viburnum are the underlayer of trees. *Azalea*, hollies, *Leucothoe*, *Pieris*, *Rhododendron*, and *Pyracantha* surround displays of annuals and bulbs. Twentyfive acres of bluegrass, ryegrass, and fescue struggle to survive in the heavy shade and foot traffic of the 30,000 residents.

Mero's staff uses six Lockes, one Yazoo, and a dozen Bobcat trim mowers to keep the turf in shape. Fertilizer (10-6-4) is applied every June and November. Mero uses Tupersan for a preemergence weed control and an Adikes' blend for postemergence control. He has had a particular problem with purple oxalis in areas with southwest exposure. He also has an occasional infestation of chinchbugs and grubs for which he now uses Oftanol. The turf remains green throughout the winter since the outer row of buildings blocks the wind and the heat loss from the 110 buildings keeps the internal park areas above freezing most of the winter. The crew overseeds with Manhattan in the spring and NK 200 in the fall.

Overhead view *of Peter Cooper Village and Stuyvesant Town.*

Mero relies heavily on Weed-eaters for trim. A five-acre strip of Belgium block is treated with Roundup when necessary. The central oval of the complex is irrigated.

Tree and shrub pruning is performed by a few trained members of the crew. Many lower branches of the plane trees have been removed for lack of light. The plane trees have also had problems with the tussock moth. The oaks have had occasional infestations of black aphids and the locusts have had red spider. Mero uses malathion and Sevin for tree spraying.

Residents of the complex take an active interest in the work done by the crew. One resident calls the local office of the Environmental Protection Agency every time she sees a spray unit. Efforts to reduce squirrel damage to the trees have also resulted in charges of cruelty. Havahart live traps, the most humane control available, are the only thing used for trapping squirrels. Residents have also prevented some of the pruning needed to help the turf survive. Mero feels only an owner-managed staff could really work with the residents while maintaining good will for Metropolitan.

Malavese in Hicksville, Long Island is Mero's primary supplier of equipment. Adikes and Wagner Seed provide seed and chemicals.

Bicycles and Cushman trucksters enable the crew to get around the 80 acre site quickly. Supervisors are in radio contact with the office at all times.

After 35 years with Metropolitan, Mero, an avid golfer and hunter, is retiring. His boss, Jack Velleman, an assistant vice president, has worked with Mero for most of those years. The change of guard will not be an easy one. A new manager with his own ideas might upset the careful balance between Metropolitan and the residents. The situation is being studied carefully by Staff Assistant Robert Morgan for Vice Presidents Charles Cunneen and Fred Wortman. Metropolitan continues to treat quality housing for the middle class as a prime responsibility. **WTT**

Profiles in LANDSCAPE MANAGEMENT

FAMILY-OWNED MANAGEMENT FIRM MAKES SURE 3,000 TENANTS FEEL AT HOME AT THE HAMLETS

By THOMAS PACIELLO

A sample *of The Hamlets 170 acres of developed landscape.*

Residents moving from The Hamlets apartment complex in Alexandria, VA, typically fill out a questionaire on their likes, dislikes, what they would have liked improved, etc. The majority list the grounds as one of the key reasons they liked The Hamlets. That is the highest compliment anyone could give Grounds Manager Charles Liebenow.

"I believe The Hamlets is unique in its emphasis on landscape maintenance," said Liebenow. "We believe that attractive grounds is one of the ways we attract and keep tenants." The Hamlets is owned and managed by Mark Winkler Management, a family-owned property management company. The property is approximately 350 acres, with 3000 garden apartment units on 170 acres. The remaining 180 undeveloped acres will be the site of a Radisson hotel and conference center and five office plazas.

The vision of Mark Winkler Management is to provide a self-sufficient community, similar to the nearby Crystal City. "We want people to be able to work, live and recreate within one-half square mile," said Liebenow. His maintenance crew is in many ways like The Hamlets, a self-sufficient community. Crew size ranges from 35 during the summer to as little as 15 in the dead of winter. During the transition from the busy hot season to the slow cold season Liebenow solves his manpower problem through natural attrition. "People quit, are fired, don't want to work in the winter, go back to school or get a new job," he said. "We don't have a wholesale dumping of workers when the summer ends. We've never had to lay anyone off."

The maintenance assignments are divided into regular and high-impact areas. In the summer Liebenow runs two mowing crews that cut the complex on a 7-10 day cycle. Additionally, they edge the sidewalks and "weed-eat" the areas. The crew maintains the medians that run through the complex, although they belong to the city of Alexandria. "It would be silly to have the whole area look great and have overgrown, weed-infested medians," said Liebenow. "The medians reflect on our property."

Liebenow has his spraying incorporated into his mowing crew, differing from many managers who use separate spray crews. The foreman of the mowing crew does all the spraying, which includes mulched areas, patios, mass plantings, parking lots and sidewalks. (The herbicide used is diquat, a formulation similar to paraquat.) "We found it was much more productive to have the foreman spray while he was running the mowing crew," said Liebenow. Come winter time the mowing and hedge trimming give way to mulching and leaf and snow removal. The entire property is mulched, every planting possible. Leaf removal is a very big job. The complex was built with the idea of leaving as many trees as possible, creating a tremendous leaf problem. As long as snow is not on the ground some crew members are picking up leaves.

High impact area maintenance pertains to places such as the shopping center, office plazas, flower beds, community club and rental office. These are the areas that will most likely be visited by prospective tenants and extra care is given to keep them properly maintained. They are administered on a seven day cycle and mowed every Friday (so they look good for the weekend visitors). Horticulturist Gary Lett has a crew of five men who pay special attention to the high impact areas. Lett plants a lot of annuals for color and rips them up after the first frost. The beds then lie natural until the planting season. While high impact areas require more fertilizer and herbicides, the hedges are allowed to grow in a natural form and receive less trimming than their residential relatives.

Keeping in line with being self-sufficient, Liebenow likes to do as much work in-house as possible. This has led him to experiment with numerous projects that other managers might have shipped out. "We do all the parking lot striping, some concrete and brick work, asphalt patching, stepping stones, walkways, a lot of retaining wall construction, and drainage work," said Liebenow. He stressed drainage

work, noting that The Hamlets has its share of water problems. "Keeping a lot of trees and natural areas is nice and attractive but it gives you a real maintenance headache down the road. Another reason for the water trouble is the lay of the land. We have buildings at different levels and some of the lower ones don't fair too well." Liebenow built a new board-on-board fence around one of the complex's three pools and rescreened the tennis court fences.

As new areas are developed he has been taking on more of the original landscaping chores. When Carnigie's (a Host restaurant) moved into The Hamlets, they contracted out their landscaping. "We told them it stank and offered to relandscape it," said Liebenow. "They agreed and we built some stone walls, sodded, moved plants and added some annuals." The new job looked great, Host acknowledged and now Liebenow is doing all the landscaping in the new office plazas. He has found that his crew has been up to the challenge of these light construction jobs. "We have one landscape forman that has a background in construction and that had helped," said Liebenow. "The jobs are not that complicated that you need a whole crew of trained construction workers."

He finds his best workers are those that are trainable and can do a lot of different things. The Hamlets' maintenance crew application form asks potential employees to note any training they have and what equipment they can operate. On the back of the application is a list of the work rules. After an employee is hired he is given the application back so that he has a list of the rules and can't plead ignorance if he screws up. "We strive to get rid of guys that don't produce immediately," said Liebenow. "We demand high quality and high productivity and we get it. There are a lot of guys who never show up for the second day of work but those who stay are very good workers." The maintenance office is centralized in the complex so there is a lot of supervision over the crew during the work day. From the office to any site on the complex is only a five-minute ride. The crew is dedicated, with many men coming in before starting time to load their trucks. Working hours at The Hamlets are 7 a.m. to 3:30 p.m. and, according to Liebenow, "They put in a legitimate eight-hour day."

Liebenow's crew often receives praise from the tenants and they are instructed to treat tenant plantings with care. "People love to take the areas by their apartment and grow flowers and vegetables," said Liebenow. "Tenants are notified that they must border areas that they don't want sprayed and the crew is instructed to be on the lookout for small plants and gardens." Liebenow tries to discourage tenant gardens because their is a lot of turnover of tenants at The Hamlets. Some tenants make a good start in the spring only to let their gardens wane when their spring fever subsides. Another problem is having the new tenant not want to maintain the former tenant's garden and letting it be overrun with weeds. For old-time residents who are particularly vigilant in maintaining their gardens, Liebenow has his men give them special treatment to avoid spraying their flowers. "Most people, however, really don't feel the need to beautify the grounds because they are well-maintained and very nice-looking. We have a lot of trees, shrubs and flowers near the buildings."

"We want tenants to work, live and recreate here."

Another reason for Liebenow discouraging tenants from planting gardens is that The Hamlets reserves a five-acre plot of land that is cut into 200 garden plots for tenant use. A disheartening note is that of the 120 or so plots that are occupied in the spring, less than 10 are still being maintained by the end of the summer. "But come spring time you had better have those plots available or the tenants will scream," said Liebenow. "We take great pains to prevent The Hamlet from turning into a mishmash of private gardens. Dollar-wise it's also easier to maintain."

With the management structure at The Hamlets Liebenow does not have to submit a budget outlining all his purchases for the following year. "We have a free hand to purchase what we need within reason," he said. "Because we have been fiscally responsible in the past we don't get a lot of purchasing hassles. Items over $500 such as spring/fall plantings, concrete work, equipment needs, special projects and payroll are all budgeted and need approval. Things like small equipment parts, chemicals, fertilizer, seed and compost can be purchased directly from my office." At the end of the year Liebenow submits a "Yearly Special" budget to management that consists of items that he has requested and not gotten and other items that he wish he had. One year his yearly special was a tree spade and it has proved to be an invaluable asset.

Liebenow's planting philosophy is to plant for immediate effect. In fact, many areas are overplanted so that not only is the immediate effect present but when the planting gets crowded the plants can be moved to other areas where they are needed. It is as if every new planting was a temporary nursery for future use. At The Hamlets the aim is to have year-round color, be it seasonal annuals or colorful perennials. In doing the plantings Liebenow uses a lot of compost, as much as he can lay his hands on. He is currently getting it free from a nearby plant but as landscapers continue to sing its praises, he believes that plants will start to charge for it. He is a strong supporter of compost, particularly in topdressing.

The Hamlets is a challenge for Liebenow. It has its problems. Many plants have outlived their useful plant life and need replacing and age is catching up to the older parts of the complex. (Some sections are 25 years old). But as long as tenants keep noting that the grounds is one of their main reasons for enjoying life at The Hamlets, Liebenow will accept the challenge of keeping it in shape. **WTT**

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q. *Every winter rabbits feed on some of our landscape plants and cause severe injury. Could you please recommend some methods to control this problem? (Ohio)*

A. Rabbits can multiply in large numbers from summer to fall and can cause extensive feeding damage to a variety of landscape plants, particularly during winter time when the food supply is limited. You can try one or several of the following methods to overcome the problem.

The best method is to use one-inch mesh chicken wire up to 30" high.

Trapping is effective to reduce the rabbit population by using any box-type trap containing bait such as apple or carrot. Rabbits are active from twilight to early morning and generally hide during the day. Trapping during winter is most effective.

Repellents can be effective. Nicotine sulfate can be sprayed every few days and after rains to reduce rabbit injury. This treatment may injur the plants - watch it.

A mixture of powdered rosin (7#) and denatured ethyl alcohol (1 gallon) can be used. This mixture is kept in a tight container and shaken occasionally; it may take 24 hours in a warm room to dissolve the materials. The solution can be applied in the fall by using a brush on dry trees about two feet above the snow cover. It can also be sprayed with knapsack sprayers.

Another material called "Chew-Not," manufactured by Nott Products Company, is 20% Thiram for rabbit control.

Hot Sauce is sometimes used as a repellent. Preparation of this sauce is very important; therefore, the materials should be mixed in the following order. Fill the tank partially with water. Then add 2 oz. Vapor-Gard per gallon and mix. Add 6 - 8 oz. hot sauce (any brand) per gallon and mix. If these materials are not mixed in this order, the hot ingredient in the sauce does not emulsify properly and may wash off the plant and will not be effective. Use only Vapor-Gard and it should stay in solution for about two hours. Material should be sprayed when temperature is above 40° F.

Q. *What should I use to get rid of grass weeds in an established bed of myrtle? (Wisconsin)*

A. Before trying to control the weeds you should have them identified by experts. Contact your local Cooperative Extension Service. If you have perennial grass weeds, the best thing to do is to dig them out. If the grass weeds are an annual type, they should be controlled with an application of pre-emergent materials. The following herbicides are labeled for use in a myrtle bed: Betasan, Emide, Eptam, Ronstar, Surflan, TOK. Read the label and follow the directions.

Q. *Lawns have been severely damaged this year by dollar spot disease. Can you suggest bluegrass cultivars which would perform well in lawns on the East Coast? (New Jersey)*

A. Dollar spot disease can be active during the entire growing season and can become very destructive during drought periods. Severely damaged areas may require overseeding.

Reports from Massachusetts indicate that bluegrass cultivars such as Adelphia, Arista, Baron, Birka, Bonnieblue, Fylking, Majestic, Merion, Pennstar and Park have performed well, while Nugget and Sydsport were less tolerant of dollar spot disease. I suggest you use a blend of several of the above cultivars for best results.

Q. *Is there some type of dye which can be added to Roundup so that you can tell where it has been applied? (Washington, D. C.)*

A. Two commercially available dyes, Rhodamine B and Methyl Violet, have been evaluated for inclusion with Roundup. Neither dye, when sprayed with Roundup onto vegetation, would give an applicator a clear distinction between treated and untreated areas during the time the entire area was being treated. The manufacturer suggests adding a one-half per cent solution of a nonionic surfactant such as Multi-Film X-77 to Roundup. He stated that the surfactant will give treated vegetation a gleam or shimmer which is discernible by the applicator during the application period.

Q. *My London plane tree trunk cracks every winter. What causes this, and will it kill the tree? Is there any way to prevent the cracking? (Massachusetts)*

A. Trees may suffer winter injury in the form of frost cracks—large vertical openings in the bark and wood extending to the center of the trees. Maple and London plane are very susceptible to cracking. Among other species effected are oak, ash, willow and linden.

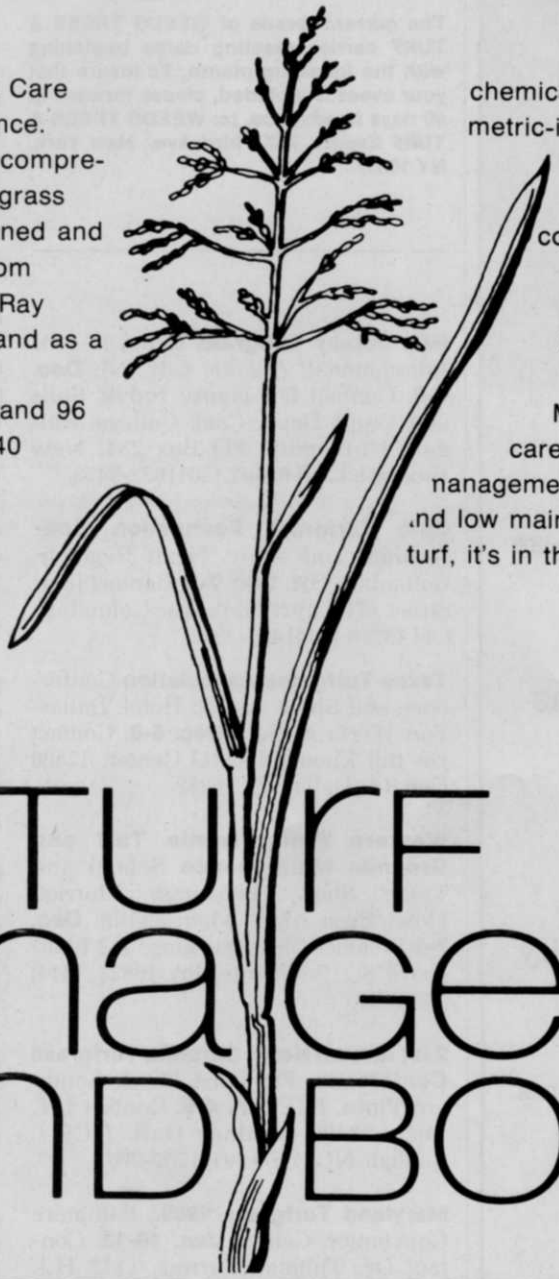
Frost cracks may appear annually. On London plane, once the crack occurs, it continues to open each winter and close in the spring. The plant may produce a callus along the edges of the crack; however, wood-rotting fungi may establish in these areas and cause rotting of the heartwood.

It was thought that the cracking or splitting was caused by sudden temperature drops below freezing; but a report from the Illinois Natural History Survey indicates that it made no difference whether the temperature drop was sudden or gradual, and neither was the condition related to lack of moisture in the soil before winter. Old wounds and poor drainage have been shown to favor the occurrence of frost cracks.

Wrapping trees with bands of Kraft paper did not reduce the incidence of frost cracks. One means of protection might be to place and tie wooden boards around the tree, particularly on the south side, to prevent possible cracking in the winter. Where a frost crack is already present, arborists may install lip bolts to prevent the split from reopening.

Send questions or comments to: Vegetation Management c/o *WEEDS TREES & TURF*, 7500 Old Oak Blvd., Middleburg Heights, OH 44130. Allow at least two months for Roger Funk's response in this column.

Finally, An Aid For Teaching Turfgrass



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New Jersey Turfgrass Expo, Resorts International, Atlantic City, NJ, **Dec. 6-9.** Contact Dr. Henry Indyk, Soils and Crops Dept., Cook College, Rutgers University, PO Box 231, New Brunswick, NJ 08903. (201) 932-9453.

Ohio Turfgrass Foundation Conference and show, Hyatt Regency, Columbus, OH, **Dec. 7-9.** Contact John Street, OTF, 1927 Neil Ave., Columbus, OH 43210. (614) 422-2592.

Texas Turfgrass Association Conference and Show, Amfac Hotel, Dallas-Fort Worth Airport, **Dec. 6-8.** Contact Dr. Bill Knoop, TAMU Center, 17360 Coit Rd., Dallas, TX 75252.

Western Pennsylvania Turf and Grounds Maintenance School and Trade Show, Pittsburgh Marriott Hotel/Expo Mart, Monroeville, **Dec. 7-9.** Contact Christine King, 412 Blanchard St., Bellefonte, PA 16823. (814) 355-8010.

21st Annual North Carolina Turfgrass Conference, Pinehurst Hotel, Southern Pines, NC, **Jan. 4-6.** Contact L.T. Lucas, 3409 Gardner Hall, NCSU, Raleigh, NC 27650. (919) 737-2751.

Maryland Turfgrass 1983., Baltimore Convention Center, **Jan. 10-12.** Contact Dr. Thomas Turner, 1112 H.J. Patterson Hall, University of Maryland, College Park, MD 20742. (301) 454-3716.

21st Nebraska Turfgrass Conference and Trade Show, Holiday Inn, Omaha, **Jan. 11-13.** Contact Robert Shearman, Turfgrass Specialist, 377 Plant Science Complex, University of Nebraska, Lincoln, NE 68583. (402) 472-2550.

New Hampshire Turf Conference, Sheraton Wayfarer Motor Inn, Bedford, NH, **Jan. 13-14.** Contact John Roberts, Extension Specialist, Plant Science Dept., Nesmith Hall, University of New Hampshire, Durham, NH 03824. (603) 862-1200.

Update on Tree Care for the Professional by Alex Shigo, US Forest Service Northeast Experiment Station, Durham, **Jan. 18-19.** Contact Ralph Burgio, UNH Div. of Continuing Education, Brook House, 24 Rosmary Ln., Durham, NH 03824. (603) 862-1089.

ALCA Annual Convention, Miami Hyatt Regency, Miami, **Jan. 15-21.** Contact Associated Landscape Contractors of America, 1750 Old Meadow Rd., McLean, VA 22102. (703) 821-8611.

Central Environmental Nursery Trade Show, The Ohio Center and Hyatt Regency House, Columbus, OH, **Jan. 24-27.** Contact Bill Stalter, Ohio Nurserymen's Association, 6075 Cleveland Ave., Columbus, OH 43229. (614) 890-5688.

Professional Turf and Landscape Conference, Tappan Zee Towne House, Nyack, NY, **Jan. 26.** Contact Eleanor Cunningham, Professional Turf and Landscape Conference, PO Box DD, Millwood, NY 10546.

Landscape/Garden Center Management Clinic, Galt House, Louisville, KY, **Feb. 6-9.** Contact National Landscape Association, 230 Southern Building, Washington, D.C., 20005. (202) 737-4060.

NAA Annual Meeting, Marriott Hotel, New Orleans, **Feb. 6-11.** Contact Robert Felix, National Arborist Association, 3537 Stratford Rd., Wantagh, NY 11793. (516) 221-3082.

GCSAA International Turfgrass Show, Georgia World Congress Center, Atlanta, **Feb. 22-24.** Contact GCSAA, 1617 St. Andrews Drive, Lawrence, KS 66044. (913) 841-2240.

Pennsylvania Turfgrass Conference and Trade Show, Hershey Lodge, Hershey, **Feb. 28 - March 3.** Contact Christine King, PTC, 412 Blanchard St., Bellefonte, PA 16823. (814) 355-8010.

Annual Canadian Turfgrass Show, The Edmonton Inn, Edmonton, Alberta, **March 13-16.** Contact Canadian Golf Superintendents Association, 698 Weston Rd., Suite 32, Toronto, Ontario M6N 3R3. (416) 767-2550.

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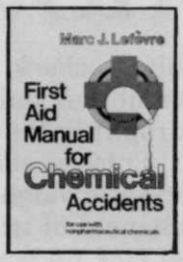

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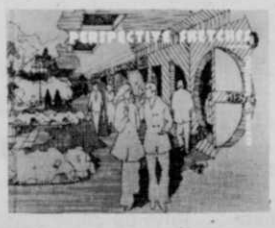

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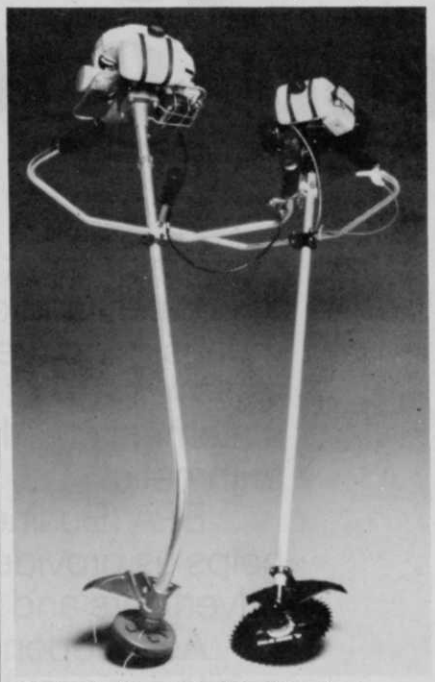

.95 inch line. Model 1000 features a 37.7cc 2-cycle engine, twin line cutting head and a 10 in. saw tooth blade. Model 657 weighs 25 lb. while Model 1000 weighs 20 lb.

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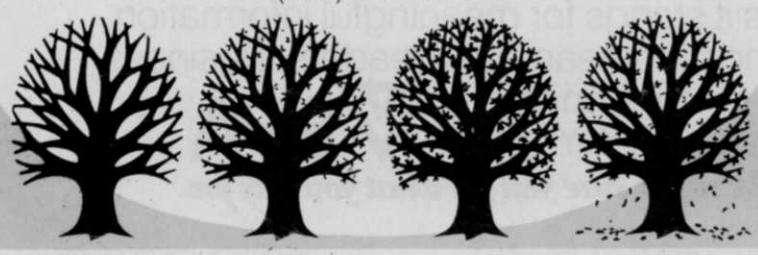
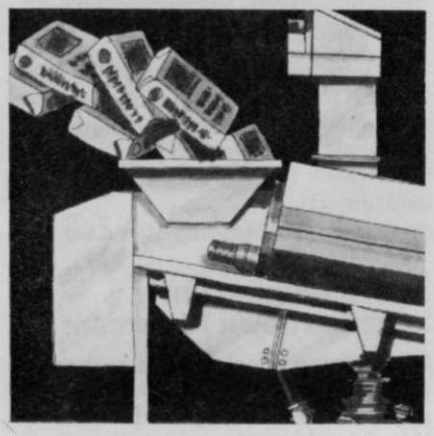
For information on exhibits or registration contact:
Colorado Nurserymen's Association
10775 N. 65th Street • Longmont, CO 80501
(303) 447-2828



Circle No. 103 on Reader Inquiry Card

mated pallet handling models. Benefits include a dust free work area for operators, reduction of material loss through almost 100% voiding of all bags, ability to reclaim packaged dry or liquid material, high handling capac-



ity, low maintenance due to fewer moving parts than other systems and compatability for automatic computer controlled operation. The Bergu system operates on paper, plastic and hemp bags.

Circle No. 121 on Reader Inquiry Card

Handles up to eight-inch diameter trees

Vermeer Manufacturing Co.'s TS-86T tree spade features five hydraulically-controlled digging spades which form a ball up to 87 in. in diameter and 53 in. deep. A low-silhouette reduction gear box and rack and pinion drive maxi-

mize limb clearance inside the spade, and a maximum rear-half height of 85 in. allows operation close to other trees and structures. A dual control system allowing operation from cab or next to rear-half assembly is optional.

Circle No. 122 on Reader Inquiry Card

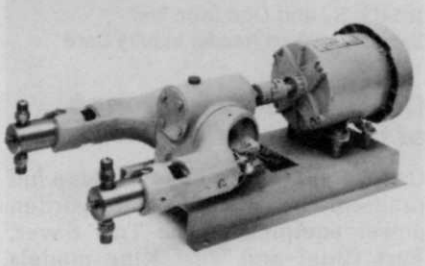
Long term control of dust

Arco Chemical Co. has developed a dust suppressant said to exhibit greater post-application stability than other currently available products. Dusbloc 220 is a stable petroleum emulsion designed to prevent fugitive dust dispersion from paved surfaces by penetrating the cover layer to bind loose particles into a continuous protective coating. It is completely miscible in any ratio without phase separation, non-corrosive, non-flammable, does not cling to shoes or tires and meets the requirements of the mining industry for an all weather dust suppressant.

Circle No. 123 on Reader Inquiry Card

Injector can be pre-programmed

Periodically adding fertilizers, herbicides and nutrients can be done quickly and easily with a remote control in-



jector from Jaeco Pump Co. The sturdy, rust-proof, corrosion-resistant unit is remote controlled by transmitter or CB radio, and is available in gas and belt-driven models with capacities from 1 to 680 gallons per hour. Optional features include a preset timer and electrical switch.

Circle No. 124 on Reader Inquiry Card

Results and recommendations within two weeks

Green Pro Cooperative Services announces a professional soil testing service with laboratory analysis and recommendations covering 14 essential points including type of soil, organic matter content, pH, primary, secondary, micro-nutrients and soluble salts. The data is reported on an easy-to-understand form.

Circle No. 125 on Reader Inquiry Card

Tilts and has winch for loading

Jacobsen's 2800 lb. capacity Model 80 trailer features a 6-ft. by 10-ft. 9-in. all-steel bed that tilts and carries a 1200 lb.

continued on page 48

With the Lancer 350, 2 men can cover a lot of ground.

The only thing small about the Lancer 350 Hyrdro-Mulcher is its size. On the job, this 350-gallon unit is a giant.

In a normal work day, a two-man crew can cover:

- **4 home lawns (21,000 sq. ft.) on 6 tankloads, or**
- **1 apartment or condo lawn (42,000 sq. ft.) on 12 tankloads, or**
- **1 athletic field (63,000 sq. ft.) on 18 tankloads.**

The Lancer 350, mounted on a single-axle trailer, handles seed, sprig, fertilizer and/or mulch operations. It comes with four nozzles and a 50′ extension hose. Optional is a high-pressure pump for herbicide and fungicide application.

For more information, including a free catalog, write or call today.

Bowie Industries, Inc.
P.O. Box 931 Bowie, Texas 76230 817/872-2286

Circle No. 102 on Reader Inquiry Card

capacity winch for loading and unloading equipment. A complete light package meets all I.C.C. highway requirements and a breakaway switch activates the brakes if the trailer suddenly becomes disconnected. Other safety features are an expanded metal 30-in. tailgate, 8-in. bed rails, eight tie-down loops and 10-in. by 2-¼-in. hydraulic surge brakes.

Circle No. 126 on Reader Inquiry Card

Heavy retract spring assures positive pop-down

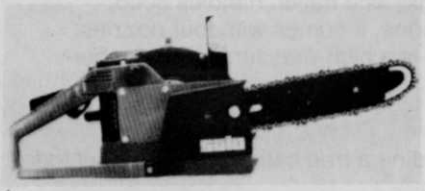
Rain Bird Sprinkler Manufacturing Corp. adds a short range rotor pop-up to its Mini-Paw list with the 15103-SR. Features are a 7864 in. orifice, low gallonage operation, low angle and

short radius stream and low application rates to resist runoff and puddling. Side and bottom inlets are ½ in., pop-up heights is 3 in. and throw range is 14 ft. to 23 ft. A multi-function wiper seal flushes, seals and wipes the pop-up stem.

Circle No. 127 on Reader Inquiry Card

Powerful for its size

Multimot chain saw from Solo Inc. is 1½ hp gasoline-powered with reduction gear drive system. Automatic



oiling system for chain, front and rear hand guards, safety throttle interlock, chain catcher and a ten inch low kick bar and chain are standard. The chain saw has a low, 80 decibal noise level and many attachments that can be changed without tools.

Circle No. 128 on Reader Inquiry Card

Fertilizes and controls insects in turf

Lakeshore Equipment and Supply Co. provides the turf manager with fertilizer and insect control combination products designed to give varying amounts of slow-release nitrogen and proven insect control. Lesco fertilizer with Dursban is available in five formulations including 40-0-0, 32-5-7, 32-5-7, and 39-0-0 in 4E, 2E and 2.32 granular. Lesco fertilizer with Diazinon is available in 30-5-7 formulation in 14G, 5G and Diazinon 500.

Circle No. 129 on Reader Inquiry Card

Carlisle offers full range of turf tires

Carlisle Tire and Rubber Co. has a full range of tires for lawn and garden power equipment. The Turf Saver, Turf Chief and Turf King models feature a high-flotation, broad-shouldered design for minimal lawn tear-up, three tread patterns for traction, and are available in 40 different sizes to fit almost any rim. The Sawtooth, Stud and Knobby models for drive and front wheels on hand carts, fun carts, slo-speed transport carts and other equipment are available in 32 sizes.

Circle No. 130 on Reader Inquiry Card

Van chassis makes workshop on wheels

Morrison Division of Scovill's Walk-Thru is installed on a cutaway chassis that provides the maximum in load space with the efficiency of a van chassis. A total of 12 storage compartments with outside access doors are featured

with four accessible from inside. The covered top provides an additional 190 cubic feet of load space with panel rear doors, six plexiglass skylights and a three piece front bulkhead for driver load protection.

Circle No. 131 on Reader Inquiry Card

Tool changing time knocked down 75 percent

RayGo has a knock out tool system for its Gator soil stabilizer that reduces downtime for a complete tool change by as much as 75 percent. Knock out

tools come with cutting edges of hardened steel or a tungsten carbide insert. Tools are tapped into holders and held in place by a compression cord wedged between each tool and holder.

Circle No. 132 on Reader Inquiry Card

Suited for professional and homeowner

Trencher from Ground Hog, Inc. is powered by a 5 hp engine and cuts a trench 3 in. wide by up to 12 in. deep. Features include oversize pneumatic tires, heavy duty steel fabrication, easi-

ly replaced hardfaced blades and a screw conveyor to deposit cuttings at the side of the trench. The trencher is compact and easy to operate and has four engine options available.

Circle No. 133 on Reader Inquiry Card

Supplied-air system protects face, breathing

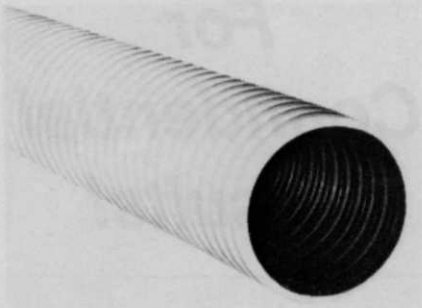
Racal Airstream, Inc. has a supplied-air system for industrial and agricultural applications not requiring head protection, the AC30 Flowstream

Crown System. It features an air regulating control for user adjustment of airflow, worn at the waist. Clear, raiseable faceshield is fitted with a full Tyvek seal.

Circle No. 134 on Reader Inquiry Card

Drainage tubing exceeds standards

Hancor, Inc. adds Agri-flow Plus tubing to its existing line of farm drainage products to give it a three-tiered product line offering. The tubing has a



white outer layer to prevent stretching caused by high temperatures, has 50% more strength than soil conservation service standards require, and displays superior flexibility during installation.

Circle No. 135 on Reader Inquiry Card

Resists crabgrass encroachment

Reliant Hard Fescue turfgrass for low maintenance areas, from Lofts Seed, Inc., performs well without supplemental irrigation or fertilizer, is adaptable to sun or shade, is cold tolerant and possesses disease resistance. The synthetic cultivar provides an attractive dark green, leafy, low-growing, fine textured turf.

Circle No. 136 on Reader Inquiry Card

Highly durable and smooth operating

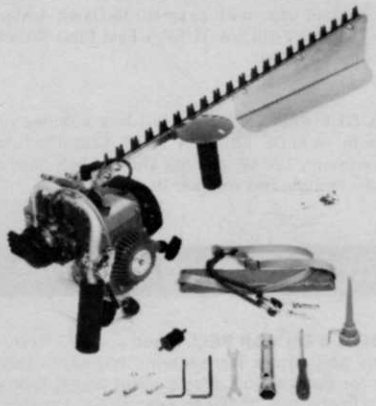
Bolens Corp. Model 1700 Hydro is one of the six models in the new Eliminator series. The tractor features a new chas-

sis and provides for shaft driven attachments. The mid-priced model replaces the Bolens QT-17 at a lower price point.

Circle No. 137 on Reader Inquiry Card

Allows feed of large twigs and branches

Lanco's Robin Model HT-02B compact, lightweight hedge trimmer provides an open 1.4 tooth pitch with a 30 in. cutter bar that operates at 29 strokes per second. The engine mounting results in vibration-free operation and



the diaphragm-type carburator allows use in any vertical or horizontal position. The unit is gear-driven, powered by a 2-stroke 22.5 cc engine, weighs 10.5 lb. and has heavy-duty grips and hand guard.

Circle No. 138 on Reader Inquiry Card

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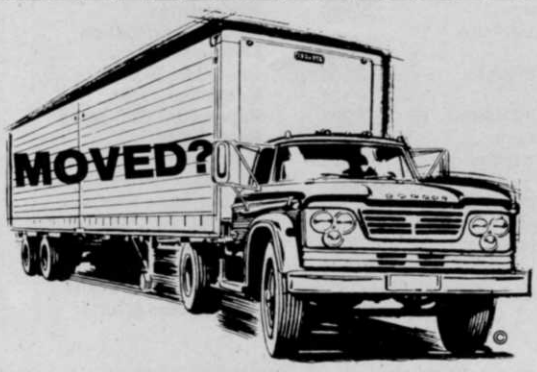

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Choose a 32", 36" or 48" cutting width to meet your specific needs and enjoy the confidence that comes with good grooming.

Optional riding sulky and grass catchers available for all three units. Mowers are equipped with either 11 HP Briggs & Stratton or 11 HP Honda engine.

See your Ransomes Bob Cat distributor or call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038, (414) 699-2000.

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Model 68" Triplex

The beauty of a National is only in the eye of its user!

Ask the superintendent who uses a National... he'll tell you it's a quality-built, rugged machine with a no-nonsense design that makes maintenance easier and faster. Field reports show that National mowers are one-third to one-half the cost of maintaining competitive models. Just one example of National's commitment to build a mower that can be maintained easily and inexpensively is the use of standard, off-the-shelf belts. That means *there's no down time* waiting for a special, high-priced replacement which is only available from the manufacturer.

Ask the greens committee what's beautiful about a National. They'll tell you it's the "bottom line." Compare it yourself. You'll find a *National offers a lower initial cost* than comparable, competitive models.

Ask the club membership about the fuel savings. In an area of exact size and growth, performance tests proved that National reel mowers used from 20 to 42 gallons less than two other nationally known, hydrostatic-type rotary mowers. Consider what that means in dollar savings in just one year!

In these days when purchase price, fuel economy, continuous performance and long life are most important, look to National to do more work, with easier and faster maintenance, over a longer, much longer period!

Call for a demonstration soon.

Model 84" Triplex

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